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SECTION

VEHICLE CHARGING SYSTEM

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PRECAUTIONS

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PRECAUTIONS

Precaution for Technicians Using Medical Electric

INFOID:000000007071850

OPERATION PROHIBITION

WARNING:

- Parts with strong magnet is used in this vehicle.
- Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.

NORMAL CHARGE PRECAUTION

WARNING:

- If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.
- As radiated electromagnetic wave generated by on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.

Precaution at telematics system operation

WARNING:

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator(ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.

Precaution at intelligent key system operation

WARNING:

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of intelligent key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of intelligent key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before intelligent key use.

Point to Be Checked Before Starting Maintenance Work

INFOID:000000007079402

The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.

NOTE:

If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000007080039

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS

PRECAUTIONS

< PRECAUTION >

system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

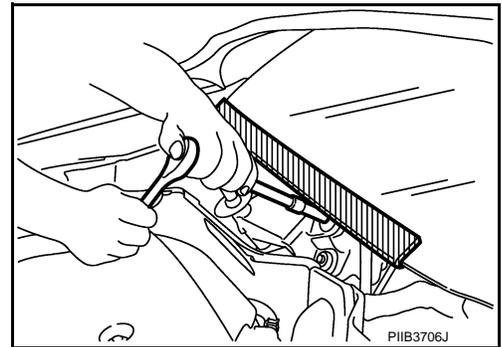
Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the power switch ON, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000006987695

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precaution for Removing 12V Battery

INFOID:000000006987696

When removing the 12V battery, turn ON/OFF the power switch and check that the charging status indicator does not blink. The 12V battery must be removed within one hour after checking the indicator lamp.

NOTE:

- The automatic 12V battery charge control may start even when the power switch is in OFF state.
- The automatic 12V battery charge control does not start within approximately one hour when the power switch is turned ON/OFF.

High Voltage Precautions

INFOID:000000006987697

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.

PRECAUTIONS

< PRECAUTION >

- Be sure to wear insulating protective equipment consisting of glove, shoes and face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

The colors of the high voltage harnesses and connectors are all orange. Orange "High Voltage" labels are applied to the Li-ion battery and other high voltage devices. Do not carelessly touch these harnesses and parts.

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

The vehicle contains parts that contain powerful magnets. If a person who is wearing a pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.

PROHIBITED ITEMS TO CARRY DURING THE WORK

Because this vehicle uses components that contain high voltage and powerful magnetism, do not carry any metal products which may cause short circuits, or any magnetic media (cash cards, prepaid cards, etc.) which may be damaged on your person when working.

POSTING A SIGN OF "DANGER! HIGH VOLTAGE AREA. KEEP OUT"

PRECAUTIONS

< PRECAUTION >

To call the attention of other workers, indicate "High voltage work in progress. Do not touch!" on vehicles where work is being performed on the high voltage systems.

Person in charge: _____
DO NOT TOUCH!
REPAIR IN PROGRESS.
HIGH VOLTAGE
DANGER:
DANGER:
HIGH VOLTAGE
REPAIR IN PROGRESS.
DO NOT TOUCH!
Person in charge: _____
Copy this page and put it after folding on the roof of the vehicle in service.
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PREPARATION

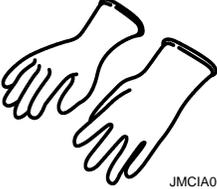
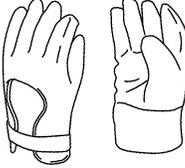
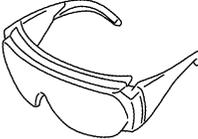
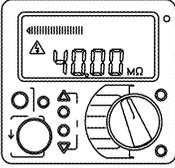
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PREPARATION

Commercial Service Tools

INFOID:000000007079182

Tool name		Description
<p>Insulated gloves [Guaranteed insulation performance for 1000V/300A]</p>	 <p>JMCIA0149ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Leather gloves [Use leather gloves that can fasten the wrist tight]</p>	 <p>JPCIA0066ZZ</p>	<ul style="list-style-type: none"> • Removing and installing high voltage components • Protect insulated gloves
<p>Insulated safety shoes</p>	 <p>JPCIA0011ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Safety glasses [ANSI Z87.1]</p>	 <p>JPCIA0012ZZ</p>	<ul style="list-style-type: none"> • Removing and installing high voltage components • To protect eye from the spatter on the work to electric line
<p>Insulated helmet</p>	 <p>JPCIA0013ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Insulation resistance tester (Multi tester)</p>	 <p>JPCIA0014ZZ</p>	<p>Measuring voltage and insulation resistance</p>

COMPONENT PARTS

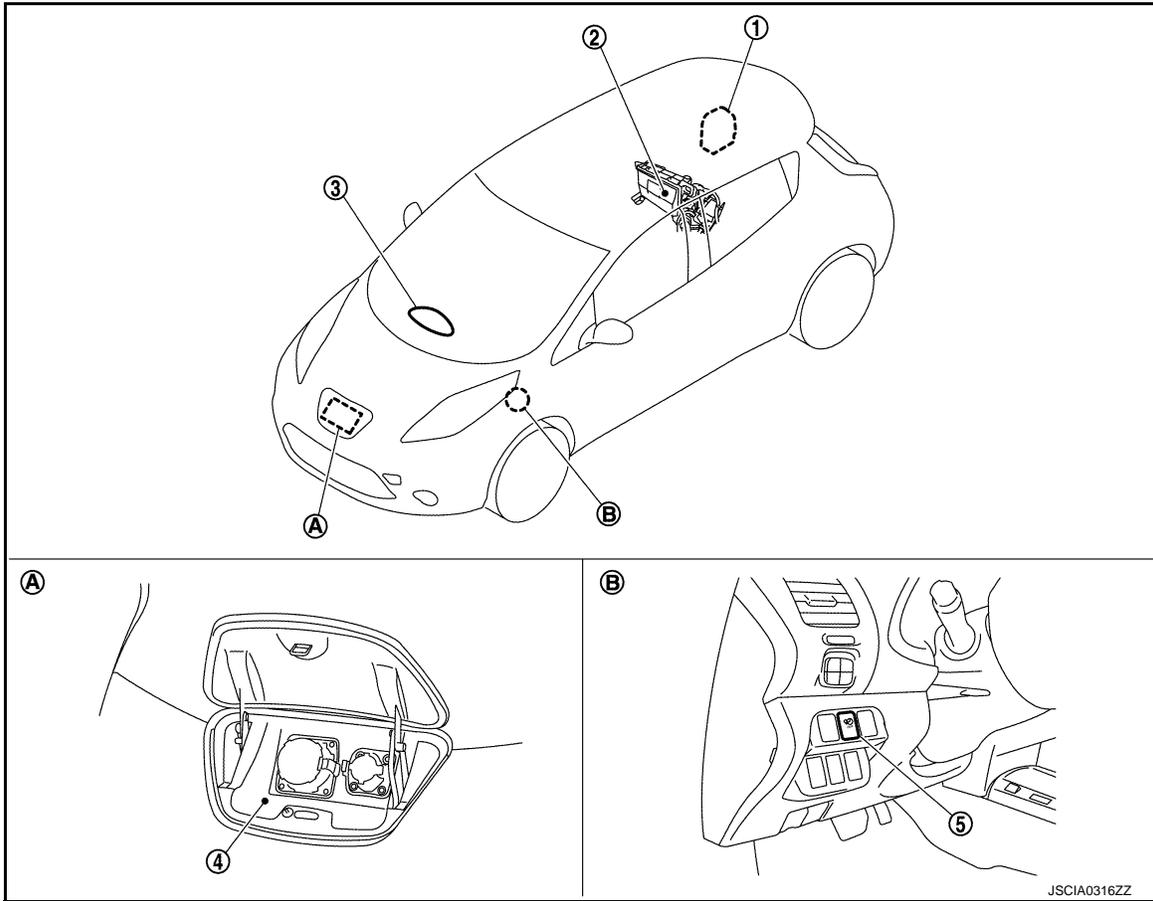
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000006987699

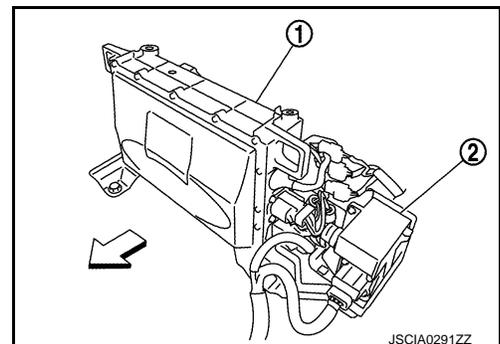


No.	Component	Reference
1	EVSE	VC-10, "EVSE"
2	On-board charger	VC-9, "On-board Charger"
3	Charging status indicator	VC-11, "Charging Status Indicator"
4	Charge port	VC-10, "Charge Port"
5	Immediate charging switch	VC-10, "Immediate Charging Switch"

On-board Charger

INFOID:000000006987700

The on-board charger (1) converts external AC power to DC power (260 – 410 V) and charges the Li-ion battery. When charging, the on-board charger communicates with VCM, LBC, EVSE control box and quick charger, and starts charging corresponding to the charge type. Furthermore, a noise filter (2) is installed in the on-board charger to prevent the noise generated by the vehicle from affecting the external power supply side.



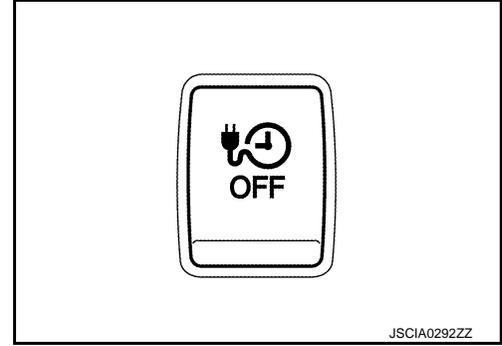
COMPONENT PARTS

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Immediate Charging Switch

INFOID:000000006987701

The immediate charging switch is a switch that can be used to start charging immediately when timer charging is set.

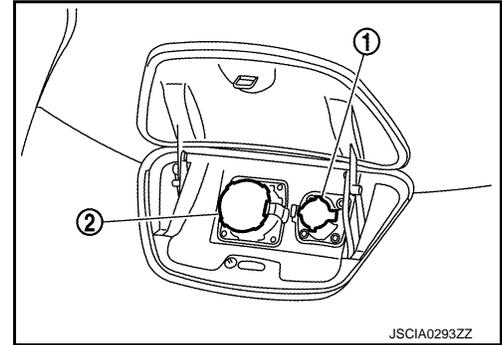


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Charge Port

INFOID:000000006987702

The charge port is installed at the front of the vehicle and is equipped with a normal charge port (1) and a quick charge port (2). For charging, connect the EVSE or quick charge connector to the charge port according to the type of charging, and then start charging. The charge port integrates an connection detecting circuit. If a malfunction is found in the connection, it can be detected with the on-board charger.



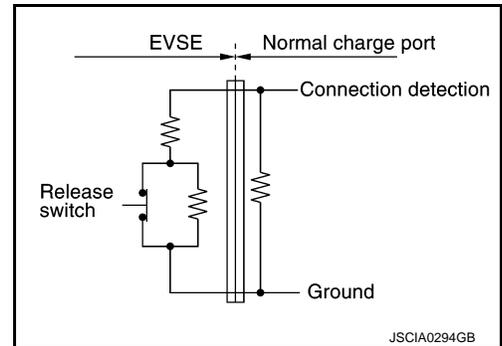
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EVSE

INFOID:000000006987703

The EVSE (Electric Vehicle Supply Equipment) is manufactured based on the specifications prescribed in SAE-J1772, and is an optional part for charging by connecting a commercial power source to the vehicle. The EVSE consists of a socket, cable, control box, and a charging connector and supplies power to the vehicle using commercial power. By conducting PWM communication with the on-board charger, the EVSE performs the safe and suitable charging for the vehicle.

The charging connector is equipped with a release switch to maintain the connection between the normal charging port and the charging connector. In addition, a circuit for detecting the hold status is incorporated into the release switch, which stops the charging temporarily if the release switch is pressed during charging.



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The control box is equipped with an indicator that can be used to check the charging status and malfunction detection status. The indicator operates in the following cases when a commercial power supply is connected to the EVSE.

<List of Operations>

Vehicle condition	Illumination status		
	Power	Charge	Fault
When there is AC power supply input and the EVSE can communicate with the vehicle charger (when not charging)	ON	OFF	OFF
Charging	ON	ON	OFF
When there is no AC power supply input	OFF	OFF	OFF

COMPONENT PARTS

< SYSTEM DESCRIPTION >

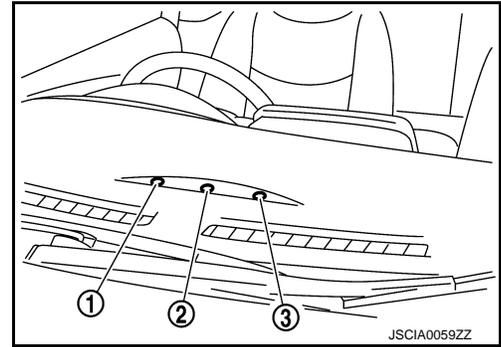
Vehicle condition	Illumination status		
	Power	Charge	Fault
When the EVSE is not operating	OFF	OFF	OFF
When the EVSE detects electric leakage	ON	OFF	Blink
When the AC power supply voltage drops	ON	OFF	Blink
When the EVSE detects a malfunction in itself	ON	OFF	ON

Charging Status Indicator

INFOID:000000006987704

Charge indicator lamp is mounted at the upper part of the instrument panel. It indicates the charge status of the Li-ion battery.

- 1 : Charge indicator lamp 1
- 2 : Charge indicator lamp 2
- 3 : Charge indicator lamp 3



Charge indicator lamp illuminates and blinks as per the following:

Indicator illuminating pattern

	Full charge	During charge	Timer charge ON	Immediate charge ON	During automatic 12V battery charge
Indicator lamp					
Illuminating (blinking) time					
Condition	ON for 15 minutes.	Charging rate (X) 1: $X < 33\%$ 2: $33\% \leq X < 66\%$ 3: $66\% \leq X < 99\%$	ON-OFF repeats for 15 seconds.	ON for 15 minutes.	ON repeatedly during operation.

: Illuminating
 : Blinking

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SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM

System Description

INFOID:000000006987706

DESCRIPTION

On-board charger uses a 2-converter system which consists of the PFC circuit and the DC/DC converter. It improves charging efficiency, full-charge accuracy and service life of the Li-ion battery. On-board charger judges if external power supply is 100 V or 200 V, and automatically switches to the charging appropriate for the power supply.

NOTE:

PFC (Power Factor Correction) circuit is a power factor improvement circuit. It is a device for converting AC power (input from external source) to DC power efficiently.

DESCRIPTION OF CHARGE CONTROL

For information about charge control, refer to [EVC-36, "LI-ION BATTERY CHARGE CONTROL : System Description"](#).

Charge Mode

Charge mode		Remaining charge level	Time required for charge (at 25°C)
Normal charge mode	Immediate charge	100%	AC 200 V: Approx. 8 hours AC 100 V: Approx. 28 hours (Charging from Li-ion battery available charge level low*1 to 100%)
	Timer charge	80% or 100% (selectable)	
	Remote charge	100%	
Quick charge mode		Remaining battery at the start of charging is less than 50%: 90%*2 Remaining battery at the start of charging is 50 % or more: 100% NOTE: When the specified time lapses, charging stops if charge level is not sufficient.	Approx. 30 minutes (Charging from Li-ion battery available charge level low*1 to 100%)

*1: Low battery charge lamp illuminates.

*2: After charging stops, additional charging by quick charge is possible.

Normal Charge Mode (Immediate Charge)

Normal charge mode (immediate charge) immediately starts charging when EVSE is connected. When timer charge is not set, charging is immediately started when the charge connector is connected to the charge port. When timer charge is set, immediate charge mode is selected after the immediate switch is pressed.

Normal Charge Mode (Timer Charge)

Normal charge mode (timer charge) starts/stops charging by the timer set in VCM. Charge level can be set to 80% or 100%.

Normal Charge Mode (Remote Charge)

Normal charge mode (remote charge) starts charging by remote control with mobile tool.

Quick Charge Mode

Quick charge mode performs charging with quick charger. Maximum charge level varies depending on the remaining level of the Li-ion battery at the start of charging. When charging is not completed and the charge time set on the quick charger or the time out (approximately 60 minutes) set on the vehicle elapses, charging stops.

NOTE:

If charging stops before charging is complete, additional charging by quick charge can be performed again.

System Diagram

INFOID:000000006987707

For information regarding the circuit diagram, refer to [EVC-26, "ELECTRIC POWER TRAIN SYSTEM : Schematic"](#).

STRUCTURE AND OPERATION

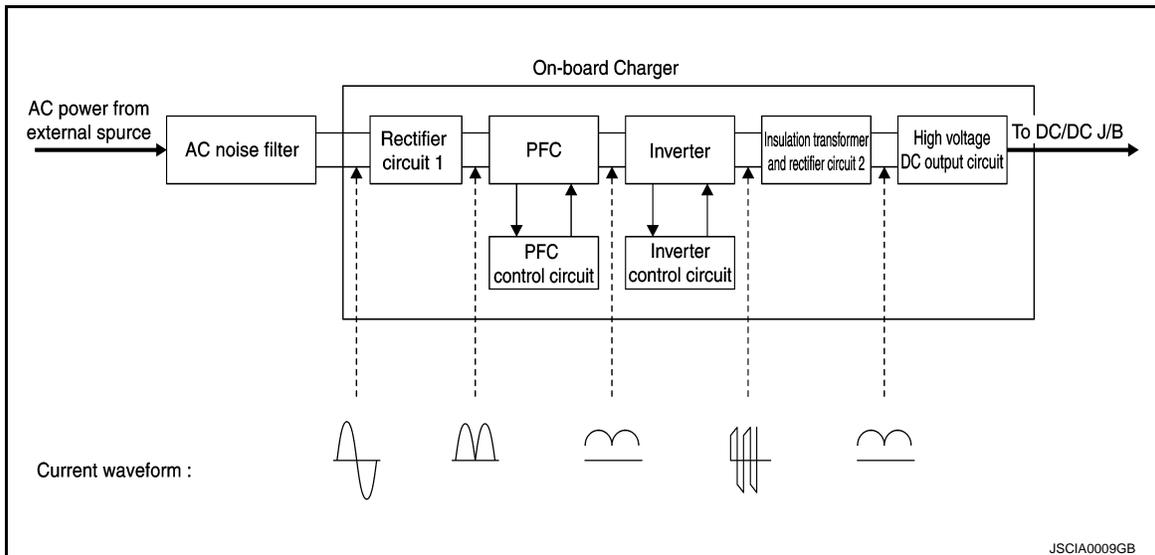
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STRUCTURE AND OPERATION

On-board Charger

INFOID:000000006987708

OPERATION PRINCIPLE



1. AC power which is externally given is rectified to DC power with rectifier circuit 1.
2. The voltage of the rectified DC power is boosted during the power factor improvement in the PFC circuit.
3. The voltage-boosted DC power is converted back to AC power with the inverter.
4. The AC power from the converter is boosted by the insulated transformer and is rectified to high-voltage DC power by rectifier circuit 2.
5. The rectified high-voltage DC power is output by the output circuit.

NOTE:

PFC (Power Factor Correction) circuit is a power factor improvement circuit. It is a device for converting AC power (input from external source) to DC power efficiently.

HANDLING PRECAUTION

< SYSTEM DESCRIPTION >

HANDLING PRECAUTION

Li-ion Battery Charging System

INFOID:000000006987709

HANDLING OF CHARGE CABLE, CHARGE PORT AND CHARGE CONNECTOR

- Never touch metal terminals of the charge port or the charge connector.
- Never modify or disassemble charge cable, charge connector, or charge port.
- Never apply excessive force to the charge cable.
 - Never pull.
 - Never twist.
 - Never drag.
- Never place a heavy item on charge cable.
- Never place near a heating device (heater, etc.).
- Never drop or subject to strong impact.

PRECAUTIONS FOR CHARGING

- Use genuine NISSAN EVSE only.
- Check that there is no foreign material such as water or dust in the charge port or the charge connector.

WARNING:

- **Since there may be risk of electric shock, never touch the charge gun or charge port if they contain foreign material.**
- **Since there may be risk of electric shock or electric leakage, never connect the charge gun or charge port if they contain foreign material.**
- Check that there is no rust, corrosion or damage on the charge port or charge gun. Check that there is no loosening at the time of connection.

WARNING:

Since electric leakage, electric shock, short-circuit or fire may occur, never charge if any problem is found.

- Never perform charging when the connection is heavily exposed to water.
- Never perform charging with the body cover attached.
- Never perform charging when there may be risk of lightning.
- Stop charging immediately when an unusual odor or smoke is found during charging.
- Never place hand near the cooling fan during charging.

NOTE:

The cooling fan may automatically start operation during charging when the power switch is turned OFF.

- After charging, securely close the cover and lid of the charge port to prevent entry of water or dust.
- To turn on READY after charging, operate it after disconnecting the charge connector from the charge port.

NOTE:

When the charge connector is connected to the charge port, READY is disabled.

- To prevent electric shock or fire arising from electric leakage, use a waterproof plug with grounding connected to the ground fault interrupter.
- For charging with AC 100 V, use 15 A rating or more plug. For charging with AC 200 V, use 20 A rating or more plug.

WARNING:

If a plug with a low current rating is used or if a plug adapter is installed and used in combination with an other device, the plug may cause abnormal heating, resulting in a fire.

- For charging, never use a generator or any other power source other than specified.

NOTE:

Charging may not be performed correctly or a malfunction may occur.

- When quick charging is performed, be sure to use a quick charger compatible with the vehicle.

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ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:000000006987710

This system is an on board diagnostic system that detects a malfunction automatically. A malfunction is stored in ECU memory as a DTC. The diagnostic information can be obtained with CONSULT.

Counter System

INFOID:000000006987711

In this system, Operating power switch OFF⇒ON is defined as 1 trip. When a malfunction is detected, the VCM saves the DTC and freeze frame data and continues saving it up to a maximum of 40 trips. In addition, if a DTC that is the same as the saved DTC is redetected, the counter is reset and the count-up starts from "0" again.

DTC and Freeze Frame Data

INFOID:000000006987712

The VCM can save multiple DTC but can only save one freeze frame data. After the VCM has detected a malfunction and saves the DTC and freeze frame data, if a different malfunction is detected, multiple DTC are confirmed, but only the freeze frame data that is saved first can be confirmed. The DTC and freeze frame data can be deleted when the self-diagnostic is deleted.

DIAGNOSIS SYSTEM (OBC)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (OBC)

CONSULT Function

INFOID:000000006987713

FUNCTION

Diagnostic test mode	Function
ECU Identification	VCM part number can be read.
Self-diagnostic result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the VCM can be read.

*: The following diagnosis information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- Freeze frame data

SELF-DIAG RESULTS MODE

Self Diagnostic Item

- Regarding items of DTC, refer to [VC-24. "DTC Index"](#).
- Regarding items of DTC sub type, refer to [VC-25. "DTC Sub Type Index"](#).

Freeze Frame Data

The Freeze Frame Data shows the status of the vehicle when the DTC is detected and is useful for recreating the status when the malfunction occurred.

Freeze Frame Data Item List

Freeze frame data item	Description
Q/CHG CONNECT DETECT	Displays the connection status of the quick charge connector.
Q/CHG START/STOP SIG 1	Displays the input status of the charge start/stop signal 1 from the quick charger.
Q/CHG START/STOP SIG 2	Displays the input status of the charge start/stop signal 2 from the quick charger.
QUICK CHARGE PERMIT	Displays the transmitting status of the charge start permission signal being sent to the quick charger.
N/CHG RELAY +	Displays the control status of the normal charge relay (+).
N/CHG RELAY -	Displays the control status of the normal charge relay (-).
Q/CHG RELAY +	Displays the control status of the quick charge relay (+).
Q/CHG RELAY -	Displays the control status of the quick charge relay (-).
EVSE SIGNAL PULSE WIDTH [μs]	Displays the pulse width of the PWM signal being sent from the EVSE.
PWM SIGNAL	Displays the reception status of the PWM signal being sent from the EVSE.
N/CHG CONNECT DETECT V [V]	Displays AC input power voltage.
N/CHG CONNECT STATUS	Displays the engagement detection status of the EVSE charge connector.
Q/CHG RLY VOLT SEN [V]	Displays the signal voltage of the quick charge voltage sensor.
ON BOARD CHARGER TEMP [degC]	Displays the on-board charger internal temperature.
Q/CHG PORT TEMP	Displays the quick charge port temperature status.
VCM ACTIVAT REQ	Displays the send status of the EV system activation request signal to the VCM.
12V POWER SUPPLY [V]	Displays 12V battery power supply voltage.
CHG CONNECT DETECT V [V]	Displays the signal voltage of the engagement detection circuit of the EVSE charge connector.
TIME	Displays the number of DTC detected trips.
ELAPSED TIME	Displays the time elapsed since the detection of the DTC.

DATA MONITOR MODE

Monitored Item

DIAGNOSIS SYSTEM (OBC)

< SYSTEM DESCRIPTION >

MONITOR ITEM	Unit	Description
Q/CHG CONNECT DETECT	CNCT/DIS-CNCT	Displays the connection status of the quick charge connector. <ul style="list-style-type: none"> • CNCT: The quick charge connector is connected. • DISCNCT: The quick charge connector is not connected.
Q/CHG START/STOP SIG 1	OPEN/HIGH	Displays the input status of the charge start/stop signal 1 from the quick charger. <ul style="list-style-type: none"> • OPEN: Charge start button OFF • HIGH: Charge start button ON
Q/CHG START/STOP SIG 2	OPEN/LOW	Displays the input status of the charge start/stop signal 2 from the quick charger. <ul style="list-style-type: none"> • OPEN: Isolation check with a quick charger is NG or not completed. • LOW: Isolation check with a quick charger completed normally.
QUICK CHARGE PERMIT	LOW/OPEN	Displays the transmission status of the charge start permission signal being sent to the quick charger. <ul style="list-style-type: none"> • LOW: Allow quick charge start • OPEN: Quick charge start is not allowed
N/CHG RELAY +	On/Off	Displays the normal charge relay (+) control status. <ul style="list-style-type: none"> • On: Normal charge relay (+) is ON. • Off: Normal charge relay (+) is OFF.
N/CHG RELAY -	On/Off	Displays the control status of the normal charge relay (-). <ul style="list-style-type: none"> • On: Normal charge relay (-) is ON. • Off: Normal charge relay (-) is OFF.
Q/CHG RELAY +	On/Off	Displays the control status of the quick charge relay (+). <ul style="list-style-type: none"> • On: Quick charge relay (+) is ON. • Off: Quick charge relay (+) is OFF.
Q/CHG RELAY -	On/Off	Displays the control status of the quick charge relay (-). <ul style="list-style-type: none"> • On: Quick charge relay (-) is ON. • Off: Quick charge relay (-) is OFF.
EVSE SIGNAL PULSE WIDTH	μs	Displays the pulse width of the PWM signal being sent from the EVSE.
PWM SIGNAL	OK/NONE	Displays the reception status of the PWM signal being sent from the EVSE. <ul style="list-style-type: none"> • OK: Communicating normally. • NONE: Not communicating
N/CHG CONNECT DETECT V	V	Displays AC input power voltage.
N/CHG CONNECT STATUS	NONE/ CNCT/ INPUT	Displays the engagement detection status of the EVSE charge connector. <ul style="list-style-type: none"> • NONE: The charge connector is not engaged or there is no PWM communication from the EVSE. • CNCT: There is no AC input in the charge connector connected status. • INPUT: There is AC input in the charge connector connected status.
Q/CHG RLY VOLT SEN	V	Displays the signal voltage of the quick charge voltage sensor.
ON BOARD CHARGER TEMP	degC	Displays the on-board charger internal temperature.
VCM ACTIVAT REQ	LOW/HIGH	Displays the send status of the EV system activation request signal to the VCM. <ul style="list-style-type: none"> • HIGH: EV system start is being requested. • LOW: EV system start is not being requested.
Q/CHG PORT TEMP	OK/NG	Displays the quick charge port temperature status. <ul style="list-style-type: none"> • OK: Normal • NG: Temperature is high
12V POWER SUPPLY	V	Indicates 12V battery power supply voltage.
CHG CONNECT DETECT V	V	Displays the signal voltage of the engagement detection circuit of the EVSE charge connector.

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ON BOARD CHARGER

Reference Value

INFOID:000000006987714

VALUES ON THE DIAGNOSIS TOOL

Specification data represents reference values.

NOTE:

- The displayed data may differ from an actual signal/value/operation, as some of them are calculated by on board charger, based on signals transmitted from on board charger-related sensors to on board Charger.
- Charging does not start in the POWER ON status. Start charging before POWER ON when it is necessary to be in the POWER ON status and the charging status.

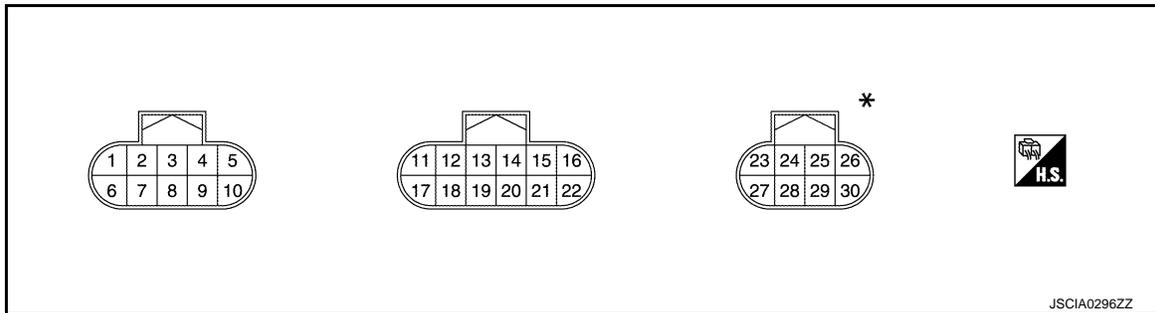
MONITOR ITEM	CONDITION		Values/Status
QUICK CHG PORT	POWER ON	Quick charging connector: Connected	CNCT
		Quick charging connector: Not connected	DISCNCT
QUICK CHARGER START SIG	POWER OFF	Quick charger charge start button: Not pressed	OPEN
		Quick charger charge start button: Pressed	HIGH
QUICK CHARGE ACTIV SIG	<ul style="list-style-type: none"> • POWER OFF • No malfunction in the charging system • Immediately after charging button operation 		LOW⇒HIGH
QUICK CHARGE PERMIT	<ul style="list-style-type: none"> • POWER OFF • No malfunction in the charging system • Immediately after charging button operation 		LOW⇒HIGH
N/CHG RELAY +	Normal charging in progress		On
	Not normal charging		Off
N/CHG RELAY -	Normal charging in progress		On
	Not normal charging		Off
Q/CHG RELAY +	Quick charging in progress		On
	Not quick charging		Off
Q/CHG RELAY -	Quick charging in progress		On
	Not quick charging		Off
EVSE SIGNAL PULSE WIDTH	AC power: 12 A		220 μs (Approx.)
	AC power: 16 A		250 μs (Approx.)
	AC power: 30 A		500 μs (Approx.)
PWM SIGNAL	Normal charging in progress		OK
	Except above		OFF
N/CHG INTRLCK DETECT V	Indicates AC input power voltage.		
N/CHG INTRLCK STATUS	Normal charging in progress		INPUT
	When the EVSE charge connector is not connected		OFF
Q/CHG RLY VOLT SEN	Power switch: ON		0 V
	During quick charging		4 V (Approx.)

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

MONITOR ITEM	CONDITION		Values/Status
ON BOARD CHARGER TEMP	Depending on the on board charger temperature.		-40 – 215°C Indicates depending on the on board charger temperature.
EV SYS W/L REQ	POWER ON	EV system warning lamp: ON	On
		Except above	Off
F/S REQ	POWER ON	During fail-safe mode	On
		Except above	Off
VCM ACTIVAT REQ	POWER OFF		On
			Off
Q/CHG PORT TEMP	When the quick charge port is abnormally hot		NG
	Except above		OK
12V POWER SUPPLY	POWER ON (not READY)		11 – 14 V
	READY		13 – 14 V
CHG CONNECT DETECT V	When the EVSE charge connector is connected		0.747 – 2.129 V
	When the EVSE charge connector is not connected		3.629 – 4.780 V

TERMINAL LAYOUT



*: With quick charge port

PHYSICAL VALUES

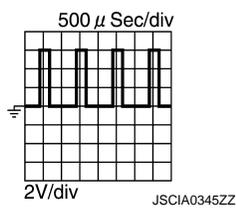
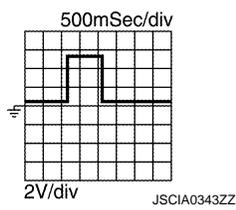
NOTE:

Specification data are reference values.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1	22	Quick charge activation signal	Input	During quick charging	6.5 V or more ^{*1}
				Except above	0 V
2	22	Quick charger isolation check signal	Input	After turning ON the quick charge start button.	6.5 V or more ^{*1} ⇒0 V
3	22	Quick charge engagement signal	Input	Quick charge connector is connected.	1.5 V or less
				Quick charge connector is not connected.	12V battery voltage
4	22	Quick charge permit signal	Output	During quick charging	0 V
5	—	Ground	—	—	—
6	—	Quick charger communication-H (CAN)	Input/ Output	—	—
7	—	Quick charger communication-L (CAN)	Input/ Output	—	—

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
9	22	EVSE communication (PWM)	Input	Immediately after normal charge connector is connected.	12 V → 9 V (Approx.)
				During normal charging	
10	22	EVSE engagement signal	Input	Normal charge connector is normally connected.	0.747 – 2.129 V
				Normal charge connector is not connected.	3.629 – 4.780 V
11	Ground	Battery power supply	Input	Always	12V battery voltage
12	Ground	Battery power supply	Input	Power switch: ON	12V battery voltage
13	Ground	POWER ON power supply	Input	Power switch: ON	12V battery voltage
14	Ground	Normal charge relay (+) power supply	Output	Normal charge relay: Operating	
				Except above	M/C relay power supply
15	Ground	Normal charge relay (-) power supply	Output	Normal charge relay: Operating	
				Except above	M/C relay power supply
16	Ground	Quick charge relay (+) power supply	Output	Quick charge relay: Operating	Less than 1 V
				Except above	M/C relay power supply
17	Ground	Quick charge relay (-) power supply	Output	Quick charge relay: Operating	Less than 1 V
				Except above	M/C relay power supply
18	22	EV system activation signal	Output	Power switch: OFF⇒ON NOTE: When turn power switch OFF to ON, the on-board charger sends the voltage signal to check the system for approximately 1 second.	
19	—	EV system CAN-H	—	—	—
20	—	EV system CAN-L	—	—	—
21	Ground	Plug in signal	Output	Charging connector is connected.	3 V (Approx.)
				Charging connector is not connected.	12V battery voltage
22	—	Ground	—	—	—
25	22	Quick charge port temperature sensor*2 signal 1	Input	Quick charge port temperature: 24°C	0.26 – 0.49 V
				Quick charge port temperature: 50°C	0.32 – 0.68 V
26	22	Quick charge port temperature sensor*2 signal 2	Input	Quick charge port temperature: 24°C	0.26 – 0.49 V
				Quick charge port temperature: 50°C	0.32 – 0.68 V

A

B

VC

D

E

F

G

H

I

J

K

L

M

N

O

P

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
27	22	Quick charge voltage sensor signal-L	Input	During quick charging	0.5 V or less
				Except above	2.5 V (Approx.)
28	22	Sensor power supply (Quick charge voltage sensor*3)	Output	In Quick Charging	5 V (Approx.)
29	—	Sensor ground (Quick charge voltage sensor*3)	—	—	—
30	22	Quick charge voltage sensor signal-H	Input	During quick charging	4.5 V or more
				Except above	2.5 V (Approx.)
40	Ground	High voltage harness connection detecting circuit power supply	Output	Power switch: ON	
41	Ground	High voltage harness connection detecting circuit signal	Input	When the high voltage harness of normal charge port is connected.	
				When the high voltage harness of normal charge port is not connected.	2.5 V (Approx.)
43	Ground	High voltage harness connection detecting circuit power supply	Output	Power switch: ON	
44	Ground	High voltage harness connection detecting circuit signal	Input	When the high voltage harness (DC side) is connected.	
				When the high voltage harness (DC side) is not connected.	2.5 V (Approx.)

*1: The voltage changes depending on Quick charger.

*2: Quick charge port temperature sensor is built into the quick charge port.

*3: Quick charge voltage sensor is built into the DC/DC converter.

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Fail-Safe

INFOID:000000006987715

FAIL-SAFE

When there is a malfunction with the on board charger, charging is stopped as a fail-safe.

FAIL-SAFE LIST

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe	VC
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	×	A
B2802	Q/CHG ISOLATION SIGNAL ERROR	SIGNAL STUCK LOW	×	B
		SIGNAL STUCK HIGH	×	
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	×	C
B2813	ON BOARD CHARGER	SIGNAL STUCK LOW	×	D
B2814	ON BOARD CHARGER	SIGNAL STUCK HIGH	×	E
B2820	QUICK CHARGER	—	×	F
B2821	12V POWER SUPPLY	SIGNAL STUCK LOW	—	G
		SIGNAL STUCK HIGH	—	
B2827	NORMAL CHARGE RELAY	SIGNAL STUCK LOW	×	H
B2830	QUICK CHARGE VOLTAGE SENSOR	CMPNENT INTERNAL MLFNCTN	×	I
B2840	ON BOARD CHARGER	ELECTRICAL MALFUNCTION	×	J
		PARAMETRIC	×	
		CMPNENT INTERNAL MLFNCTN	×	
		COMPONENT/SYS OVER TEMP	×	
B2850	OBC TEMP SENSOR	SIGNAL STUCK HIGH	×	K
		SIGNAL INVALID	×	
B2880	F/S RELAY	SIGNAL STUCK LOW	×	L
		SIGNAL STUCK HIGH	×	
B28A0	NORMAL CHARGE INTERLOCK (AC)	SIGNAL STUCK HIGH	×	M
B28B0	NORMAL CHARGE INTERLOCK (DC)	SIGNAL STUCK HIGH	×	N
B2900	ON BOARD CHARGER	PROGRAM MEMORY ERROR	×	O
		DATA MEMORY ERROR	×	
B2902	ON BOARD CHARGER	MEMORY ERROR	×	P
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	×	N
		COMPONENT/SYS OVER TEMP	×	
B29A0	N/CHG PORT ENGAGEMENT ERROR	SIGNAL STUCK HIGH	×	O
		SIGNAL INVALID	×	
B29C1	EVSE	SIGNAL STUCK LOW	×	P
		SIGNAL STUCK HIGH	×	
		SIGNAL INVALID	×	
		NO SIGNAL	×	
		UNEXPECTED OPERATION	×	
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×	P
		ERRATIC	×	
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×	P
		ERRATIC	×	
U100A	CAN COMM ERROR	MISSING MESSAGE	×	P

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×
U1010	ON BOARD CHARGER	INTERNAL ELECTRIC MALFNCTN	×

DTC Index

INFOID:000000006987716

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×	1	VC-41
		ERRATIC	×	1	VC-41
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×	1	VC-42
		ERRATIC	×	1	VC-42
U100A	CAN COMM ERROR	MISSING MESSAGE	×	1	VC-45
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×	1	VC-42
U1010	ON BOARD CHARGER	INTERNAL ELECTRIC MALFNCTN	×	1	VC-46
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	×	1	VC-47
B2802	Q/CHG ISOLATION SIGNAL ERROR	SIGNAL STUCK LOW	×	1	VC-50
		SIGNAL STUCK HIGH	×	1	VC-50
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	—	1	VC-53
B2813	ON BOARD CHARGER	SIGNAL STUCK LOW	×	1	VC-54
B2814	ON BOARD CHARGER	SIGNAL STUCK HIGH	×	1	VC-55
B2820	QUICK CHARGER	—	—	1	VC-56
B2821	12V POWER SUPPLY	SIGNAL STUCK LOW	×	1	VC-57
		SIGNAL STUCK HIGH	×	1	VC-57
B2827	NORMAL CHARGE RELAY	SIGNAL STUCK LOW	×	1	VC-58
B2830	QUICK CHARGE VOLTAGE SENSOR	CMPNENT INTERNAL MLFNCTN	×	1	VC-60
B2840	ON BOARD CHARGER	ELECTRICAL MALFUNCTION	×	1	VC-64
		PARAMETRIC	×	1	VC-64
		CMPNENT INTERNAL MLFNCTN	×	1	VC-64
		COMPONENT/SYS OVER TEMP	×	1	VC-64
B2850	OBC TEMP SENSOR	SIGNAL STUCK HIGH	×	1	VC-66
		SIGNAL INVALID	×	1	VC-66
B2880	F/S RELAY	SIGNAL STUCK LOW	×	1	VC-67
		SIGNAL STUCK HIGH	×	1	VC-67
B28A0	NORMAL CHARGE INTERLOCK (AC)	SIGNAL STUCK HIGH	×	1	VC-71
B28B0	NORMAL CHARGE INTERLOCK (DC)	SIGNAL STUCK HIGH	×	1	VC-74
B2900	ON BOARD CHARGER	PROGRAM MEMORY ERROR	×	1	VC-76
		DATA MEMORY ERROR	×	1	VC-76
B2902	ON BOARD CHARGER	MEMORY ERROR	×	1	VC-76
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	×	1	VC-77
		COMPONENT/SYS OVER TEMP	×	1	VC-77

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
B29A0	N/CHG PORT ENGAGEMENT ERROR	SIGNAL STUCK HIGH	×	1	VC-80
		SIGNAL INVALID	—	1	VC-80
B29C1	EVSE	SIGNAL STUCK LOW	×	1	VC-84
		SIGNAL STUCK HIGH	×	1	VC-84
		NO SIGNAL	×	1	VC-84
		UNEXPECTED OPERATION	× or —	1	VC-84

DTC Sub Type Index

INFOID:0000000006987717

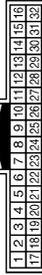
Items (CONSULT screen terms)	DTC sub type name	Remarks
ELECTRICAL MALFUNCTION	General Electrical Malfunction	
SIGNAL STUCK LOW	Signal Stuck Low	
SIGNAL STUCK HIGH	Signal Stuck High	
SIGNAL INVALID	Signal Invalid	
NO SIGNAL	No Signal	
MEMORY ERROR	General Memory Error	
DATA MEMORY ERROR	Data Memory Error	
PROGRAM MEMORY ERROR	Program Memory Error	
INTERNAL ELECTRIC MALFNCTN	Internal Electronic malfunction	
INCRRCT COMPNT INSTALLED	Incorrect Component Installed	
OVER TEMPERATURE	Over Temperature	
ALIV/CNT INCRCT/NOT UPDAT	Alive / Sequence Counter Incorrect / Not Updated	This sub type is used by the control module to indicate that a signal was received without the corresponding rolling count value being properly updates.
SIG PRTCTN CLCLTN INCRCT	Value of Signal Protection Calculation Incorrect	This sub type is used by the control module to indicate, that a message was processed with an incorrect protection (checksum) calculation.
MISSING MESSAGE	Missing Message	This sub type is used for malfunctions where one (or more) expected message(s) is not received.
ERRATIC	Erratic	This sub type is used for malfunctions where the serial data, is momentarily implausible or discontinuous.
PARAMETRIC	Parametric	
NO OPERATION	No Operation	
UNEXPECTED OPERATION	Unexpected Operation	
CMPNENT INTERNAL MLFNCTN	Component Internal malfunction	
COMPONENT/SYS OVER TEMP	Component or System Over Temperature	

ON BOARD CHARGER

< WIRING DIAGRAM >

VEHICLE CHARGING SYSTEM

Connector No.	B3
Connector Name	WIRE TO WIRE
Connector Type	TH22MW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	-
3	SHIELD	-
4	B	-
5	W	-
6	R	-
11	G	-
15	L	-
16	G	-
18	L	-
19	BR	-
20	Y	-
22	B	-
27	L	-
31	L	-
32	P	-

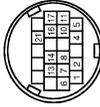
Connector No.	B9
Connector Name	WIRE TO WIRE
Connector Type	TH22PW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	GR	-
3	Y	-
4	G	-
5	BR	-
6	L	-
7	B	-

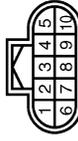
8	P	-
9	SB	-
10	LG	-
11	W	-
17	R	-
18	Y	-
19	G	-
20	V	-
21	SB	-
22	P	-
23	LG	-
24	L	-
25	Y	-
26	L	-
27	G	-
28	GR	-
29	R	-
30	R	-
31	Y	-

Connector No.	B24
Connector Name	LI-ION BATTERY
Connector Type	Yazaki: 7282-8750-30



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	EV CAN-H
2	G	EV CAN-L
4	R	IGN
5	R	BAT1
6	B	GND3
7	B	GND2
8	B	GND1
10	B	PRE CHG GND
11	G	PRE CHG V
13	B	RLV2 GND
14	L	RLV2 V
16	B	RLV1 GND
17	Y	RLV1 V
21	R	CHG IGN

Connector No.	B25
Connector Name	ON BOARD CHARGER
Connector Type	RH10FB



Terminal No.	Color of Wire	Signal Name [Specification]
1	P	QUICK CHARGE START BUTTON SIGNAL
2	SB	QUICK CHARGE ISOLATION CHECK SIGNAL
3	Y	QUICK CHARGER INTERLOCK SIGNAL
4	G	QUICK CHARGE PERMIT SIGNAL
5	BR	GROUND
6	L	QUICK CHARGER COMMUNICATION-H
7	B	QUICK CHARGER COMMUNICATION-L
9	LG	EVSE COMMUNICATION
10	W	EVSE INTERLOCK SIGNAL

Connector No.	B26
Connector Name	ON BOARD CHARGER
Connector Type	RH12FB



Terminal No.	Color of Wire	Signal Name [Specification]
11	Y	BATTERY POWER SUPPLY
12	W	BATTERY POWER SUPPLY
13	V	POWER ON POWER SUPPLY
14	P	NORMAL CHARGE RELAY +
15	LG	NORMAL CHARGE RELAY -
16	L	QUICK CHARGE RELAY +
17	SB	QUICK CHARGE RELAY -
18	GR	EV ACTIVATION REQUEST SIGNAL
19	L	EV SYSTEM CAN-H
20	G	EV SYSTEM CAN-L
21	BR	PULL IN SIGNAL
22	B	GROUND

Connector No.	B27
Connector Name	ON BOARD CHARGER
Connector Type	RH08FB



Terminal No.	Color of Wire	Signal Name [Specification]
25	W	QUICK CHARGE PORT TEMPERATURE SENSOR SIGNAL 1
26	GR	QUICK CHARGE PORT TEMPERATURE SENSOR SIGNAL 2
27	R	QUICK CHARGE VOLTAGE SENSOR SIGNAL-L
28	Y	SENSOR POWER SUPPLY QUICK CHARGE VOLTAGE SENSOR
29	G	SENSOR GROUND QUICK CHARGE VOLTAGE SENSOR
30	V	QUICK CHARGE VOLTAGE SENSOR SIGNAL-H

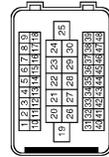
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ON BOARD CHARGER

< WIRING DIAGRAM >

VEHICLE CHARGING SYSTEM

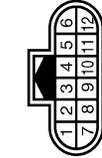
Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Type	SA33MB-RS10-SJ22



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	L	-
3	GR	-
4	LG	-
5	P	-
6	B	-
8	BR	-
10	B	-
11	W	-
12	O	-
13	G	-
14	V	-
15	SB	-
16	R	-
17	L	-
18	LG	-
20	V	-
21	G	-
22	Y	-
23	B/R	-
26	V	-
27	P	-
28	B/R	-
29	W	-
30	B/R	-
31	LG	-
32	W	-
33	Y	-
34	P	-
35	P	-
36	R	-
37	G	-
38	B/R	-
40	BR	-
41	G	-
42	SB	-
43	L	-
44	O	-

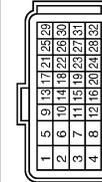
47	V	-
48	P	-

Connector No.	E60
Connector Name	WIRE TO WIRE
Connector Type	RH12MB



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	L	-
4	G	-
5	L	-
6	G	-
7	L	-
8	SB	-
9	V	-
10	O	-
11	BR	-
12	LG	-

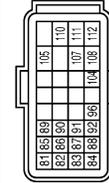
Connector No.	E61
Connector Name	VCM
Connector Type	RH24FY-R28-R-RH



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	POWER ON POWER SUPPLY
4	B/R	GROUND
5	SB	A/G RELAY
6	R	BATTERY POWER SUPPLY
7	W	SCORE RELAY
8	B/R	GROUND

9	L	EV SYSTEM CAN-H
13	G	EV SYSTEM CAN-L
15	O	ASCD BRAKE SWITCH SIGNAL
18	SB	STOP LAMP SW SIGNAL
21	R	POWER ON POWER SUPPLY
23	P	HIGH VOLTAGE CABLE INTERLOCK
25	L	CAN-H
26	Y	WATER PUMP 2 SIGNAL
28	W	WATER PUMP 1 SIGNAL
29	P	CAN-L

Connector No.	E63
Connector Name	VCM
Connector Type	RH24FB-R28-L-RH



Terminal No.	Color of Wire	Signal Name [Specification]
81	GR	K-LINE
84	LG	EV SYSTEM ACTIVATION REQUEST SIGNAL
85	P	CHARGING STATUS INDICATOR 2
86	V	CHARGING STATUS INDICATOR 1
87	L	PLUG IN INDICATOR LAMP
88	Y	AVSP CONTROL SIGNAL
89	V	IMMEDIATE CHARGING SWITCH
90	W	STARTER RELAY CONT
91	O	ELECTRIC SHIFT WARNING SIGNAL
92	G	CHARGING STATUS INDICATOR 3
96	GR	EV SYSTEM ACTIVATION REQUEST SIGNAL
104	SB	ASCD STEERING SWITCH
105	L/O	PRE-CHARGE RELAY
107	W/L	SYSTEM MAIN RELAY 1
108	BR	ASCD STEERING SWCH GROUND
110	L/Y	SYSTEM MAIN RELAY 2
111	B/R	GROUND
112	B/R	GROUND

Connector No.	E70
Connector Name	QUICK CHARGE PORT
Connector Type	RH10FB



Terminal No.	Color of Wire	Signal Name [Specification]
1	V	-
2	SB	-
3	Y	-
4	G	-
5	BR	-
6	L	-
7	O	-
9	W	-
10	R	-

Connector No.	E71
Connector Name	NORMAL CHARGE PORT
Connector Type	RH03FB



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	-
2	B	-
3	L	-

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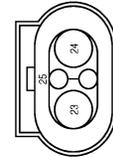
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ON BOARD CHARGER

< WIRING DIAGRAM >

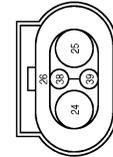
VEHICLE CHARGING SYSTEM

Connector No.	H3
Connector Name	LI-ION BATTERY
Connector Type	24342.3MA0B



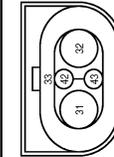
Terminal No.	Color of Wire	Signal Name [Specification]
23	O (+)	
24	O (-)	
25	SHIELD	

Connector No.	H4
Connector Name	DC/DC-J/B
Connector Type	24342.3MA0B



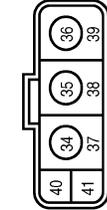
Terminal No.	Color of Wire	Signal Name [Specification]
24	O (+)	
25	O (-)	
26	SHIELD	
28	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)
29	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)

Connector No.	H5
Connector Name	ON BOARD CHARGER
Connector Type	24342.3MA0E



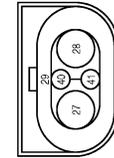
Terminal No.	Color of Wire	Signal Name [Specification]
31	O	
32	O	
33	SHIELD	
42	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)
43	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)

Connector No.	H6
Connector Name	ON BOARD CHARGER
Connector Type	TM03FOR



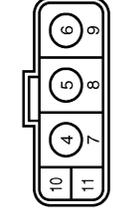
Terminal No.	Color of Wire	Signal Name [Specification]
34	O (+)	
35	O GROUND	
36	O (-)	
37	SHIELD	
38	SHIELD	
39	SHIELD	
40	O	EVSE CONNECTION-DETECTING CIRCUIT (OUT)
41	O	EVSE CONNECTION-DETECTING CIRCUIT (IN)

Connector No.	H7
Connector Name	DC/DC-J/B
Connector Type	24342.3MA0E



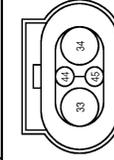
Terminal No.	Color of Wire	Signal Name [Specification]
27	O (+)	
28	O (-)	
29	SHIELD	
40	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)
41	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)

Connector No.	H8
Connector Name	NORMAL CHARGE PORT
Connector Type	FM03FOR



Terminal No.	Color of Wire	Signal Name [Specification]
4	O	
5	O	
6	O	
7	SHIELD	
8	SHIELD	
9	SHIELD	
10	O	
11	O	

Connector No.	H11
Connector Name	DC/DC-J/B
Connector Type	24342.3MA0B



Terminal No.	Color of Wire	Signal Name [Specification]
33	O (+)	
34	O (-)	
44	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)
45	—	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)

Connector No.	H12
Connector Name	WIRE TO WIRE
Connector Type	RM02FCY



Terminal No.	Color of Wire	Signal Name [Specification]
1	O	
2	G	

Connector No.	H13
Connector Name	QUICK CHARGE PORT
Connector Type	24342.3MA2B



Terminal No.	Color of Wire	Signal Name [Specification]
11	O (+)	
12	O	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)
13	L	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)

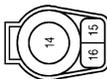
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ON BOARD CHARGER

< WIRING DIAGRAM >

VEHICLE CHARGING SYSTEM

Connector No.	H14
Connector Name	QUICK CHARGE PORT
Connector Type	24242-3M2C



Terminal No.	Color of Wire	Signal Name [Specification]
14	O	(-)
15	L	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (IN)
16	G	HIGH VOLTAGE CABLE CONNECTION-DETECTING CIRCUIT (OUT)

Connector No.	M21
Connector Name	WIRE TO WIRE
Connector Type	TH2PW-NH



16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
26	25	24	23	22	21	20	19	18	17						

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
3	SHIELD	-
4	B	-
5	W	-
6	R	-
11	G	-
15	L	-
16	G	-
18	BR	-
19	G	-
20	V	-
22	B	-
27	L	-
31	L	-
32	P	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH4CFW-NH



25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10

Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	BATTERY POWER SUPPLY
2	R	BATTERY POWER SUPPLY (FOR UPPER METER)
3	GR	POWER SWITCH SUPPLY
4	BR	POWER SWITCH SUPPLY (FOR UPPER METER)
5	B	GROUND
6	B	GROUND
7	V	ELECTRIC SHIFT WARNING SIGNAL
9	G	PLUG IN SIGNAL
10	L	COMMUNICATION SIGNAL (METER → VSP)
11	P	COMMUNICATION SIGNAL (VSP → METER)
12	V	METER CONTROL SWITCH GROUND
13	LG	ENTER SWITCH SIGNAL
14	W	SELECT SWITCH SIGNAL
15	BR	TRIP RESET SWITCH SIGNAL
16	BR	ILLUMINATION CONTROL SWITCH SIGNAL
17	V	ILLUMINATION CONTROL SIGNAL (FOR UPPER METER)
18	P	CAN-L
19	L	CAN-H
20	V	SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE)
22	GR	GROUND (FOR UPPER METER)
24	BR	ELECTRIC PARKING BRAKE CONTROL MODULE MAKEUP SIGNAL
25	SR	BRAKE FLUID LEVEL SWITCH SIGNAL
26	B	ILLUMINATION CONTROL SIGNAL
27	R	AIR BAG SIGNAL
28	R	SECURITY SIGNAL
30	GR	VEHICLE SPEED SIGNAL (8-PULSE)
32	W	COMMUNICATION SIGNAL (METER → METER)
33	LG	COMMUNICATION SIGNAL (UPPER → METER)
34	L	PLUG IN INDICATOR LAMP SIGNAL
38	V	LED HEADLAMP (RH) WARNING SIGNAL
39	LG	LED HEADLAMP (LH) WARNING SIGNAL
40	Y	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

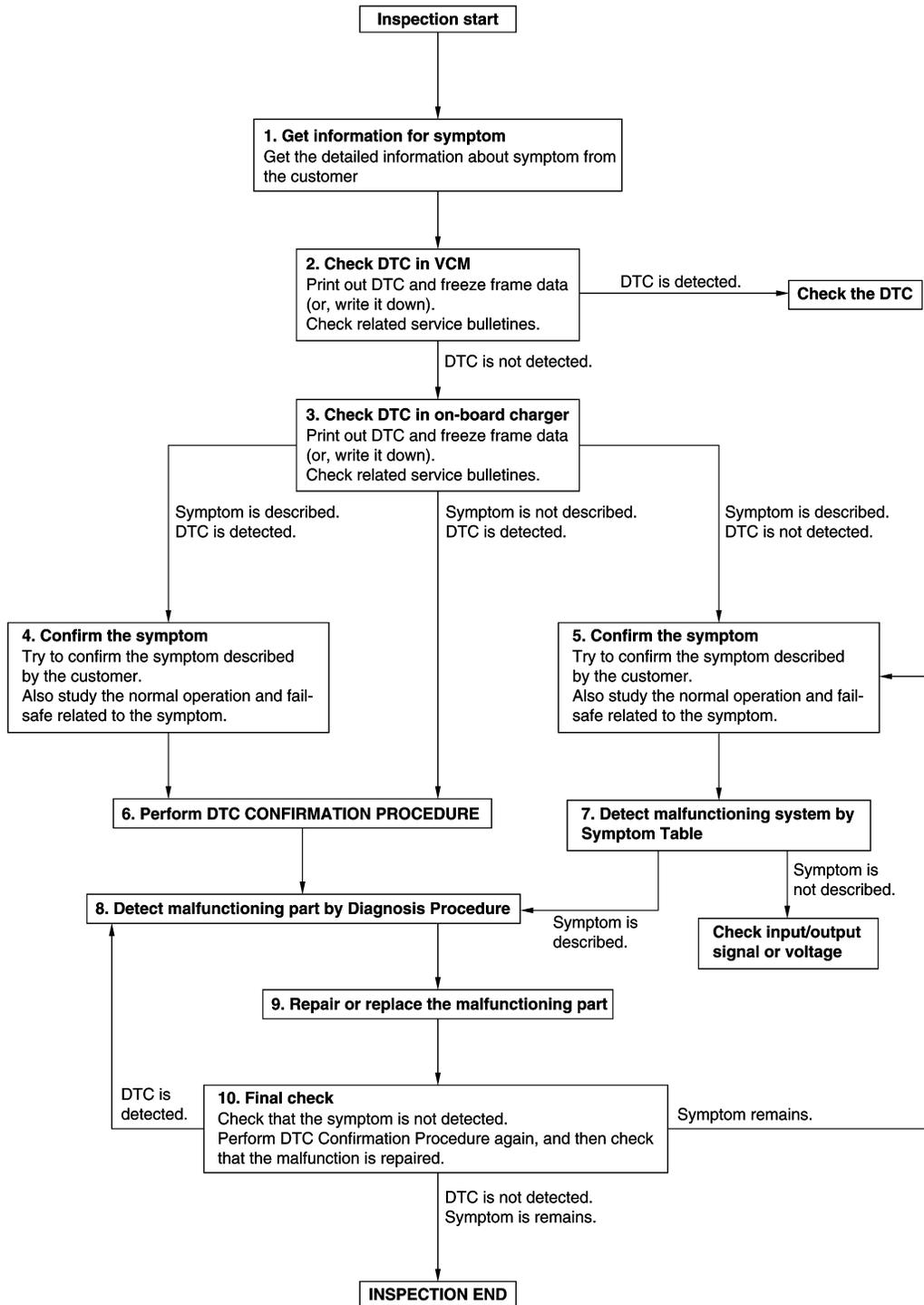
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000006987719

OVERALL SEQUENCE



DETAILED FLOW

Revision: 2010 November

VC-33

LEAF

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [VC-35, "Diagnostic Work Sheet"](#).)

>> GO TO 2.

2. CHECK DTC IN VCM

1. Check DTC in VCM.
2. Check related service bulletins for information.

Are any DTCs detected?

- YES >> Check the DTC. Refer to [EVC-78, "DTC Index"](#).
NO >> GO TO 3.

3. CHECK DTC IN ON-BOARD CHARGER

1. Check DTC in on-board charger.
2. Perform the following procedure if DTC is displayed.
 - Record DTC and freeze frame data. (Print them out with CONSULT.)
 - Erase DTC.
 - Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to [EVC-303, "Symptom Table"](#).)
3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

- Symptom is described, DTC is detected>>GO TO 4.
Symptom is described, DTC is not detected>>GO TO 5.
Symptom is not described, DTC is detected>>GO TO 6.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to [EVC-303, "Symptom Table"](#) and [VC-23, "Fail-Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to [EVC-303, "Symptom Table"](#) and [VC-23, "Fail-Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 7.

6. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected again.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

- YES >> GO TO 8.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

NO >> Check according to [GI-51, "Intermittent Incident"](#).

7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EVC-303, "Symptom Table"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

Is the symptom described?

YES >> GO TO 8.

NO >> Monitor input data from related sensors or check voltage of related on-board charger terminals using CONSULT. Refer to [VC-19, "Reference Value"](#).

8. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is a malfunctioning part detected?

YES >> GO TO 9.

NO >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it.

>> GO TO 10.

10. FINAL CHECK

When DTC was detected in step 3, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then check that the malfunction have been completely repaired.

When symptom was described from the customer, refer to confirmed symptom in step 4 or 5, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 8.

YES-2 >> Symptom remains: GO TO 5.

NO >> Before returning the vehicle to the customer, always erase DTC.

Diagnostic Work Sheet

INFOID:000000006987720

DESCRIPTION

There are many operating conditions that lead to the malfunction of "charging system" components. A good grasp of such conditions can make troubleshooting faster and more accurate.

In general, each customer feels differently about symptoms. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize the diagnostic worksheet in order to organize all the information for troubleshooting.

NOTE:

Some conditions may cause a DTC to be detected.

KEY POINTS

WHAT Vehicle & engine model
WHEN Date, Frequencies
WHERE..... Road conditions
HOW Operating conditions,
 Weather conditions,
 Symptoms

SEF907L

DIAGNOSTIC WORKSHEET

Diagnostic worksheet					
Customer name		License plate No.		Date of first registration	
		Model			
Acceptance Date		VIN		Mileage	km (mile)

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Question	Group	Information from the customer		
Vehicle condition at malfunction occurrence	R/Q/N/O	<input type="checkbox"/> READY (R) <input type="checkbox"/> Quick charge (Q) <input type="checkbox"/> Normal charge (N) <input type="checkbox"/> Others (O)		
Symptom	R	<input type="checkbox"/> "READY" not enabled <input type="checkbox"/> Poor drivability <input type="checkbox"/> Shock <input type="checkbox"/> Vibration <input type="checkbox"/> Driving impossible <input type="checkbox"/> Noise <input type="checkbox"/> Poor shifting <input type="checkbox"/> Poor braking <input type="checkbox"/> Poor acceleration <input type="checkbox"/> Low electricity consumption <input type="checkbox"/> Switch malfunction <input type="checkbox"/> Warning lamp ON <input type="checkbox"/> Others (_____)		
		Details of symptom		
		Information display indication		
		Electricity consumption	km (mile)/kW	
		Li-ion battery remaining energy	/	
	Q, N	<input type="checkbox"/> Charging unable <input type="checkbox"/> Charging discontinued <input type="checkbox"/> Slow charging <input type="checkbox"/> Poor timer charging <input type="checkbox"/> Poor remote charging <input type="checkbox"/> Immediate charging unable <input type="checkbox"/> Others (_____)		
		Details of symptom		
		Quick charger monitor indication		
	O	<input type="checkbox"/> A/C inoperative <input type="checkbox"/> Poor A/C <input type="checkbox"/> Dead 12V battery <input type="checkbox"/> Others (_____)		
		Details of symptom		
	Location/status of occurrence	R/O	<input type="checkbox"/> Not applicable <input type="checkbox"/> Ordinary road <input type="checkbox"/> Highway <input type="checkbox"/> Mountain pass <input type="checkbox"/> Rough road <input type="checkbox"/> Level road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Left/right turn <input type="checkbox"/> Others (_____)	
		Q/N/O	<input type="checkbox"/> Start of charge <input type="checkbox"/> During charging <input type="checkbox"/> After the end of charging <input type="checkbox"/> During standby of timer charging <input type="checkbox"/> During timer charging <input type="checkbox"/> At the end of timer charging <input type="checkbox"/> During remote charging <input type="checkbox"/> Others (_____)	
Driving condition	R	<input type="checkbox"/> At the system startup <input type="checkbox"/> During READY (Vehicle stopped) <input type="checkbox"/> At start <input type="checkbox"/> During acceleration <input type="checkbox"/> During driving with a constant speed <input type="checkbox"/> During coasting <input type="checkbox"/> During braking <input type="checkbox"/> Right before stopping <input type="checkbox"/> Right after stopping <input type="checkbox"/> During POWER OFF operation <input type="checkbox"/> A/C ON <input type="checkbox"/> During shift change <input type="checkbox"/> Others (_____)		
		Vehicle speed	km (MPH)	
		Accelerator pedal opening angle	/ 8	
Quick charger	Q	Quick charger maker	<input type="checkbox"/> Not applicable <input type="checkbox"/> Applicable (_____)	
		Location		
		Model number		
		Serial number		
		Setting		
Others				

CHARGE PORT

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

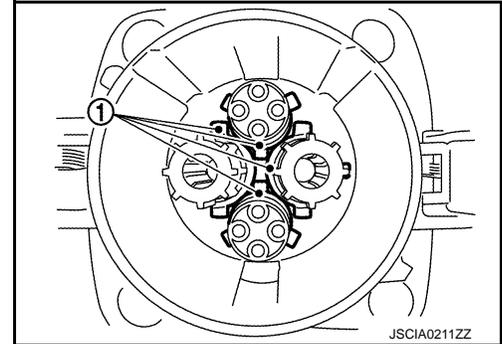
CHARGE PORT

Inspection

INFOID:000000006987721

Inspection method

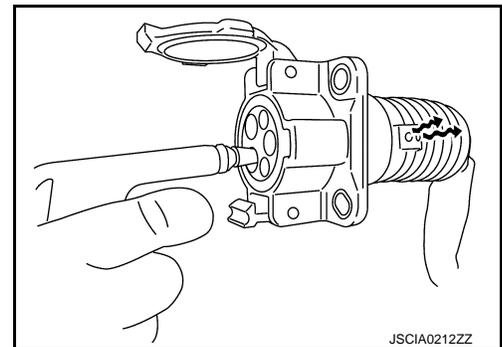
1. Visually check for the items listed below:
 - Cracks in the packing of quick charge port



- Dust and foreign matter in the quick charge port and standard charge port
 - Damage in the quick charge port and normal charge port
 - Malfunction in opening/closing the charge port caps and looseness when closed and locked.
2. Check the inside of rubber cap.
Blow air to the normal charge port to check that air exits through the rubber cap hole located on the back of the port.

NOTE:

- This inspection must be performed without disconnecting the normal charge port.
- The rubber cap hole is located on the lower part of the cap.



Handling of charge port

Cleaning of charge port

If the charge port becomes dirty, clean the port with an air blow gun.

Handling of damaged cap

Perform the following procedure if the cap becomes damaged:

- Replace charge port cap if the charge port cap becomes damaged
- Replace charge port if the packing of quick charge port becomes cracked.
- Replace charge port if the terminal of quick charge port or standard charge port becomes damaged.

Cleaning of the inside of rubber cap

At Step 2, if air does not exit through the rubber cap hole, remove the rubber cap from the port and clean the inside so that air exits through the rubber cap hole.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000006987722

1. CHECK FUSE

Check that the following fuse is not fusing.

Power supply	Fuse No.
Battery	33
	74
POWER switch ON	3

Is the fuse fusing?

- YES >> Replace the fuse after repairing the applicable circuit.
NO >> GO TO 2.

2. CHECK ON-BOARD CHARGER GROUND

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	22	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3. CHECK BATTERY POWER SUPPLY

1. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	terminal		
B26	11	Ground	12V battery voltage

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK BATTERY POWER SUPPLY CIRCUIT

1. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	11	#33 fuse terminal	Existed

2. Also check harness for short to ground.

Is the inspection result normal?

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

YES >> Check power supply circuit for battery power supply.

NO >> Repair or replace error-detected parts.

5. CHECK BATTERY POWER SUPPLY (M/C RELAY)

1. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	terminal		
B26	12	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. CHECK BATTERY POWER SUPPLY CIRCUIT

1. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	12	#74 fuse terminal	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Check M/C relay routing circuit. Refer to [EVC-281. "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

7. CHECK POWER ON POWER SUPPLY

1. Turn power switch ON.
2. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal		
B26	13	Ground	11 – 14 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

8. CHECK POWER ON POWER SUPPLY CIRCUIT

1. Turn power switch OFF.
2. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	13	#3 fuse terminal	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Check power supply circuit for POWER ON power supply.

NO >> Repair or replace error-detected parts.

U1000 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMMUNICATION

Description

INFOID:000000006987723

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006987724

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1000	CAN COMM CIRCUIT (Missing message)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	• Harness or connectors (EV system CAN communication line is open or shorted)
	CAN COMM CIRCUIT (Erratic)		

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Turn power switch ON and wait at least 5 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-41, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987725

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U1008, U100B QUICK CHARGER COMMUNICATION

Description

INFOID:000000006987726

Quick charger communication is a serial communication line for real time application. It is a multiplex communication line with high data communication speed and excellent error detection ability. On-board charger and quick charger are connected with two communication lines (quick charger communication H-line and quick charger communication L-line) and transmit/receive data.

DTC Logic

INFOID:000000006987727

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1008	QUICK CHARGER COMM (Missing message)	When on-board charger is not transmitting or receiving a quick charger communication signal for 2 seconds or more.	<ul style="list-style-type: none">• Harness or connectors (Quick charger communication line is open or shorted)• Quick charger• Quick charge port• On-board charger
	QUICK CHARGER COMM (Erratic)		
U100B	QUICK CHARGER COMM (Missing message)		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform quick charging at least 5 seconds.
2. Turn power switch ON.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [VC-42, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987728

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

Shut off high voltage circuit. Refer to GI-31, "How to Cut Off High Voltage".

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to EVB-136, "Removal and Installation".

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:



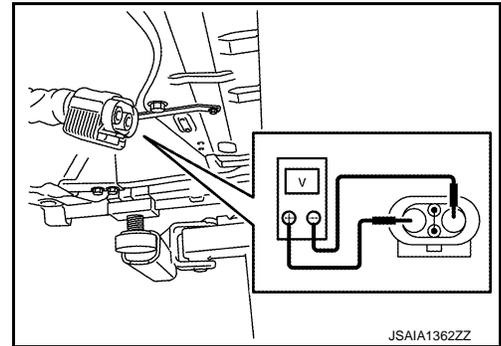
Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard : 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



>> GO TO 2.

2.CHECK QUICK CHARGER

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

>> GO TO 3.

3.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the quick charge port.

4.CHECK QUICK CHARGER COMMUNICATION CIRCUIT

1. Turn power switch OFF.
2. Disconnect quick charge port harness connector and on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	
E70	6	B25	6	Existed
	7		7	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

5. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6. REPLACE QUICK CHARGE PORT

1. Replace quick charge port. Refer to [VC-103, "Exploded View"](#).
2. Erase self-diagnostic result.
3. Perform confirmation procedure again. Refer to [VC-42, "DTC Logic"](#).
4. Check the self-diagnostic result.

Is the DTC detected again?

YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).

NO >> INSPECTION END

U100A CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U100A CAN COMMUNICATION

Description

INFOID:000000006987729

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006987730

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U100A	CAN COMM ERROR (Missing message)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	<ul style="list-style-type: none">Harness or connectors (EV system CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Turn power switch ON and wait at least 5 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-45. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987731

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-15. "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL MODULE (CAN)

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL MODULE (CAN)

DTC Logic

INFOID:000000006987732

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1010	ON BOARD CHARGER (Internal Electronic malfunction)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	<ul style="list-style-type: none">Harness or connectors (EV system CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

- Turn power switch ON and wait at least 5 seconds.
- Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to [VC-46. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987733

1. PERFORM CONFIRMATION PROCEDURE AGAIN

- Turn power switch ON.
- Erase self-diagnostic result.
- Perform DTC confirmation procedure. Refer to [VC-46. "DTC Logic"](#).
- Check self-diagnostic result.

Is the DTC detected again?

YES >> Replace on-board charger. Refer to [VC-98. "Exploded View"](#).
NO >> INSPECTION END

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

B2801 QUICK CHARGE CONNECTOR

DTC Logic

INFOID:000000006987734

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2801	Q/CHG ACTIVATION SIG ERROR (Signal invalid)	Disconnection of the charging connector is detected while the quick charge start button signal is being received from the quick charger.	<ul style="list-style-type: none">• Harness or connectors (Quick charge port circuit is open or shorted)• Quick charger• Quick charge port• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn power switch OFF.
2. Connect the quick charge connector to quick charge port.
3. Push the start button of quick charger and wait at least 1 minute.
4. Turn power switch ON.
5. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-47, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987735

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:

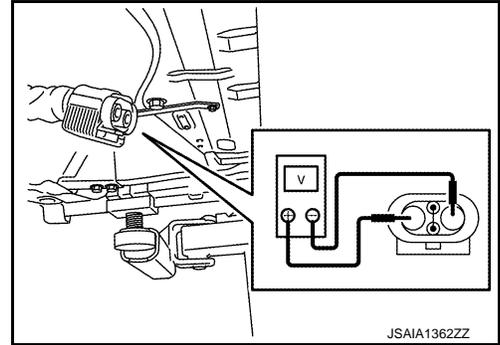


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



JSAIA1362ZZ

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2.CHECK QUICK CHARGER

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

>> GO TO 3.

3.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the quick charge port.

4.CHECK QUICK CHARGE PORT CIRCUIT

1. Turn power switch OFF.
2. Disconnect quick charge port harness connector and on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	
E70	3	B25	3	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51. "Intermittent Incident"](#).

Is inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

6. REPLACE QUICK CHARGE PORT

1. Replace quick charge port. Refer to [VC-103, "Exploded View"](#).
2. Erase self-diagnostic result.
3. Perform confirmation procedure again. Refer to [VC-50, "DTC Logic"](#).
4. Check the self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> INSPECTION END

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B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2802 QUICK CHARGER

DTC Logic

INFOID:000000006987736

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2802	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck high)	When quick charge is started, the isolation check completion signal that is sent from the quick charger could not be received.	<ul style="list-style-type: none">• Harness or connectors (Quick charge port circuit is open or shorted)• Quick charger• Quick charge port• On-board charger
	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck low)	When quick charge is started, the isolation check completion signal that is sent from the quick charger by an abnormal timing.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn power switch OFF.
2. Connect the quick charge connector to quick charge port.
3. Push the start button of quick charger and wait at least 1 minute.
4. Turn power switch ON.
5. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-50, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987737

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



- Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

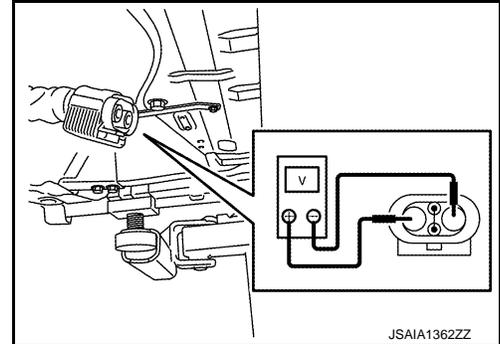


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



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>> GO TO 2.

2.CHECK QUICK CHARGER

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

Is DTC detected?

YES >> GO TO 3.

NO >> INSPECTION END (quick charger malfunction)

3.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the quick charge port.

4.CHECK QUICK CHARGE PORT CIRCUIT

- Disconnect quick charge port harness connector and on-board charger harness connector.
- Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	
E70	2	B25	2	Existed
	3		3	

- Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is inspection result normal?

B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6. REPLACE QUICK CHARGE PORT

1. Replace quick charge port. Refer to [VC-103, "Exploded View"](#).
2. Erase self-diagnostic result.
3. Perform confirmation procedure again. Refer to [VC-50, "DTC Logic"](#).
4. Check the self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> INSPECTION END

B2803 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2803 QUICK CHARGER

DTC Logic

INFOID:000000006987738

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2803	QUICK CHARGE SYSTEM (Signal stuck low)	The quick charge start signal which is sent from the quick charger is received for 1 second or more.	Quick charger

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform quick charging at least 5 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-53. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987739

NOTE:

When this DTC is detected, the cause may not be in the vehicle. Therefore after erasing the self-diagnosis result, charge using a different quick charger than the quick charger which is used when the malfunction is detected.

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B2813 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2813 NORMAL CHARGE RELAY

DTC Logic

INFOID:000000006987740

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2813	ON BOARD CHARGER (Signal stuck low)	Control circuit voltage of 9 V or more for 3 seconds or more when the normal charge relay is operating.	<ul style="list-style-type: none">• Harness or connectors (On-board charger ground circuit is open)• On-board charger

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-54, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987741

1.CHECK ON-BOARD CHARGER GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> Repair or replace error-detected parts.

B2814 QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2814 QUICK CHARGE RELAY

DTC Logic

INFOID:000000006987742

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2814	ON BOARD CHARGER (Signal stuck high)	Control circuit voltage of 9 V or more for 3 seconds or more when the quick charge relay is operating.	<ul style="list-style-type: none">• Harness or connectors• Quick charge relay• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform Quick charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-55, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987743

1. CHECK ON-BOARD CHARGER GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> Repair or replace error-detected parts.

B2820 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2820 QUICK CHARGER

DTC Logic

INFOID:000000006987744

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2820	QUICK CHARGER (No sub type)	<ul style="list-style-type: none">• A quick charger malfunction signal is received from the quick charger.• A voltage detected by the quick charger differs from the one detected by the Li-ion battery controller.• A current output from the quick charger is abnormally more than the target voltage.	<ul style="list-style-type: none">• Quick charger• Li-ion battery controller (voltage sensor)

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform quick charging at least 10 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-56, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987745

1. PERFORM SELF-DIAGNOSIS OF LI-ION BATTERY CONTROLLER

With CONSULT

Perform self-diagnosis for "HV BAT".

Is any DTC detected?

- YES >> Perform trouble diagnosis for the DTC. Refer to [EVB-34, "DTC Index"](#).
NO >> When this DTC is detected, the cause may not be in the vehicle. Therefore after erasing the self-diagnosis result, charge using a different quick charger than the quick charger which is used when the malfunction is detected.

B2821 12V POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

B2821 12V POWER SUPPLY

DTC Logic

INFOID:000000006987746

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2821	12V POWER SUPPLY (Signal stuck high)	While the on-board charger is stopped (sleep state), the power circuit voltage that is supplied from the M/C relay is 9 V or more for 60 seconds or more.	<ul style="list-style-type: none">• Harness or connectors (M/C relay power supply circuit is open or shorted.)• M/C relay routing circuit
	12V POWER SUPPLY (Signal stuck low)	While the on-board charger is operating, the power circuit voltage that is supplied from the M/C relay is less than 1 V for 3 seconds or more.	

DTC CONFIRMATION PROCEDURE

SIGNAL STUCK HIGH

1. PERFORM CONFIRMATION PROCEDURE

1. Turn power switch ON and wait for at least 10 seconds.
2. Turn power switch OFF and wait at least 90 seconds.
3. Turn power switch ON.
4. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-57, "Diagnosis Procedure"](#).
NO >> INSPECTION END

SIGNAL STUCK LOW

1. PERFORM CONFIRMATION PROCEDURE

1. Turn power switch ON and wait for at least 10 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-57, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987747

1. PERFORM TROUBLE DIAGNOSIS FOR POWER SUPPLY CIRCUIT

Perform trouble diagnosis for power supply circuit. Refer to [VC-39, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Repair or replace error-detected parts.

B2827 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2827 NORMAL CHARGE RELAY

DTC Logic

INFOID:000000006987748

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2827	NORMAL CHARGE RE- LAY (Signal stuck low)	The normal charge relay control circuit voltage is less than 1 V for 1 second or more while the normal charge relay is operated.	<ul style="list-style-type: none">• Harness or connectors• Normal charge relay• On-board charger

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Set the vehicle to READY and wait at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to [VC-58. "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987749

1.CHECK FUSE

1. Turn power switch OFF.
2. Pull out #74 fuse and check that the fuse is not fusing.

Is the fuse fusing?

YES >> Replace the fuse after repairing the applicable circuit.

NO >> GO TO 2.

2.CHECK NORMAL CHARGE RELAY DRIVE VOLTAGE-I

1. Insert the fuse which pulled out.
2. Turn power switch ON.
3. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal	Ground	11 – 14 V
B26	14		
	15		

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 3.

3.CHECK NORMAL CHARGE RELAY DRIVE VOLTAGE-II

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage (Approx.)
DC/DC J/B			
Connector	terminal	Ground	11 – 14 V
F11	3		

B2827 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Check power supply circuit for M/C relay power supply.

4.CHECK NORMAL CHARGE RELAY DRIVE CIRCUIT

1. Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	terminal	Connector	terminal	
F11	4	B26	14	Existed
	7		15	

2. Also check harness for short to ground.

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair or replace error-detected parts.

5.CHECK NORMAL CHARGE RELAY

Check the resistance between DC/DC junction box connector terminals.

Item	DC/DC J/B			Condition °C (°F)]	Resistance (Approx.)
	Connector	+	-		
		Terminals			
Normal charge relay +	F11	3	4	DC/DC J/B temperature: -40 – 80 (-40 – 176)	10 – 70 Ω
Normal charge relay -			7		

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
 NO >> Replace DC/DC junction box. Refer to [EVC-307, "Exploded View"](#).

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
 NO >> Repair or replace error-detected parts.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

B2830 QUICK CHARGE VOLTAGE SENSOR

Description

INFOID:000000006987750

The quick charge voltage sensor is installed in the DC/DC junction box. It detects the voltage between the high voltage circuit (+) side and (-) side on the upstream side of the quick charge relay (side where the quick charge port is located). The on-board charger uses this signal to monitor the status of the quick charge relay.

DTC Logic

INFOID:000000006987751

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2830	QUICK CHARGE VOLT- AGE SENSOR (Component internal mal- function)	Before quick charging is started, the high voltage system voltage sent from the quick charge voltage sensor is 200 V or more for 10 second or more.	<ul style="list-style-type: none">• Harness or connectors• Quick charge voltage sensor• DC/DC J/B• Quick charge relay• High voltage cable installation malfunction
		During quick charging, the high voltage system voltage sent from the quick charge voltage sensor is less than 200 V for 10 seconds or more.	

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform quick charging at least 30 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to [VC-60, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987752

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

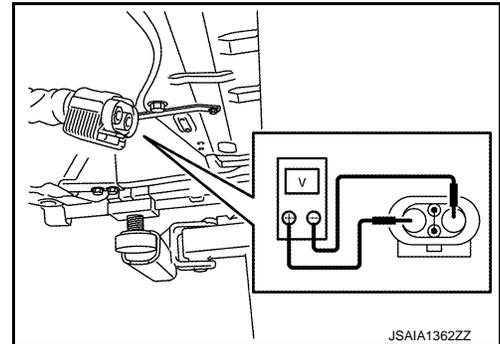


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



>> GO TO 2.

2.CHECK QUICK CHARGER

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS FOR VCM

Perform self-diagnosis for VCM.

Is DTC detected?

YES >> Perform trouble diagnosis for the DTC. Refer to [EVC-78, "DTC Index"](#).

NO >> GO TO 4.

4.CHECK QUICK CHARGE RELAY ROUTING CIRCUIT

Perform trouble diagnosis for quick charge relay routing circuit. Refer to [VC-67, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK QUICK CHARGE VOLTAGE SENSOR SIGNAL CIRCUIT

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector and on-board charger harness connector.
3. Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	Terminal	Connector	Terminal	
F12	13	B27	27	Existed
	14		28	
	15		29	
	16		30	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK QUICK CHARGE VOLTAGE SENSOR

Perform component inspection. Refer to [VC-62. "Component Inspection \(Quick Charge Voltage Sensor\)".](#)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace DC/DC junction box. Refer to [EVC-307. "Removal and Installation".](#)

7.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Clean or replace the quick charge port.

8.CHECK HIGH VOLTAGE HARNESS

1. Disconnect the high voltage harness connector from the quick charge port and DC/DC junction box.
2. Check the continuity between DC/DC junction box harness connector and quick charge harness connector.

+		-		Continuity
DC/DC J/B		Quick charge port		
Connector	Terminal	Connector	Terminal	
H11	33	H14	14	Existed
	34	H13	13	

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace the high voltage harness.

9.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51. "Intermittent Incident".](#)

Is the inspection result normal?

YES >> Replace DC/DC junction box. Refer to [EVC-307. "Exploded View".](#)

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Voltage Sensor)

INFOID:000000006987753

1.CHECK QUICK CHARGE VOLTAGE SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn power switch ON.
3. Check the voltage between on-board charger harness connector terminals.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Connector	On-board charger		Voltage
	+	-	
	Terminal		
B27	30	29	2.201 – 2.787 V
	27		
	30	27	-0.046 – 0.046 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace DC/DC junction box. Refer to [EVC-307, "Removal and Installation"](#).

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B2840 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2840 ON-BOARD CHARGER

DTC Logic

INFOID:000000006987754

DTC DETECTION LOGIC

CAUTION:

Never use extension cables to charge the battery.

NOTE:

DTC "B2840" may be detected by the use of extension cables for charging the battery.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2840	ON BOARD CHARGER (General electrical malfunction)	<ul style="list-style-type: none"> • During normal charging, the PFC output voltage in the on-board charger is 434 V or more, or 345 V or less, for 11 seconds or more. • During normal charging (100 V), the on-board charger DC output current is 10A or more for 5 seconds or more. • During normal charging (200 V), the on-board charger DC output current is 18 A or more for 5 seconds or more. • During normal charging (100 V), the on-board charger DC output current is abnormally lower than the on-board charger command current value for 5 seconds or more. • During normal charging, the DC voltage output by the on-board charger is 440 V or more, or 240 V or less for 5 seconds or more. • During normal charging, the PFC in the on-board charger operated however an abnormal status is continued for 1 second or more. 	On-board charger
	ON BOARD CHARGER (Component internal malfunction)	<ul style="list-style-type: none"> • When normal charging is started, a DC voltage output by the on-board charger of 460 V or more is detected. • During normal charging, the DC voltage output by the on-board charger is 200 V or less for 10 seconds or more. • During normal charging, the AC voltage input into the on-board charger is 293 V or more for 5 seconds or more. • During normal charging, a malfunction is detected in an on-board charger internal circuit. • During normal charging, the AC current input into the on-board charger is 22 A or more for 5 seconds or more. 	
	ON BOARD CHARGER (Component or system over temperature)	During normal charging, abnormal high temperature of an on-board charger internal circuit is continued for 100 seconds or more.	
	ON BOARD CHARGER (Parametric)	Ripple amplitude in output voltage of the on-board charger remains extremely large for 5 seconds or more during normal charge.	<ul style="list-style-type: none"> • AC power supply • EVSE • On-board charger

DTC CONFIRMATION PROCEDURE

EXCEPT "COMPONENT OR SYSTEM OVER TEMPERATURE"

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 15 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to [VC-65. "Diagnosis Procedure"](#).

NO >> INSPECTION END

COMPONENT OR SYSTEM OVER TEMPERATURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 2 minutes.

B2840 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-65, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987755

EXCEPT "PARAMETRIC"

1.PERFORM CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform DTC confirmation procedure. Refer to [VC-64, "DTC Logic"](#).
4. Check self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> INSPECTION END

PARAMETRIC

1.CHECK EVSE INDICATOR ON/OFF STATUS-I

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Connect the EVSE to the vehicle and the AC power.
4. Check the EVSE indicator ON/OFF status.

EVSE indicator	Condition
Power	ON
Charge	OFF
Fault	OFF

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK EVSE INDICATOR ON/OFF STATUS-II

Check the EVSE ON/OFF status, and verify that there are no abnormalities in the AC power. Refer to [VC-10, "EVSE"](#).

Were there no abnormalities in the AC power?

- YES >> GO TO 3.
NO >> Erase the DTC and explain to the customer that there is an abnormality in the AC power.

3.PERFORM CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform the confirmation procedure again using a EVSE other than the one that is used for the initial confirmation procedure. Refer to [VC-64, "DTC Logic"](#).

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> Check external input.

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B2850 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2850 ON-BOARD CHARGER

Description

INFOID:000000006987756

The on-board charger contains 3 temperature sensors, and monitors the temperatures of the charging circuit and control circuit board.

The on-board charger also compares the signals from each sensor and detects malfunctions of sensor characteristic.

DTC Logic

INFOID:000000006987757

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2850	OBC TEMP SENSOR (Signal stuck high)	<ul style="list-style-type: none">• During normal charging, the signal voltage of power device temperature sensor 1 in the on-board charger is 0.17 V or less, or 3.21 V or more, continuously for 3 seconds or more.• During normal charging, the signal voltage of power device temperature sensor 2 in the on-board charger is 0.24 V or less, or 3.21 V or more, continuously for 3 seconds or more.	On-board charger
	OBC TEMP SENSOR (Signal invalid)	During normal charging, a deviation in the signals of the temperature sensors in the on-board charger is continued for 100 seconds or more.	

DTC CONFIRMATION PROCEDURE

SIGNAL STUCK HIGH

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-66, "Diagnosis Procedure"](#).
NO >> INSPECTION END

SIGNAL INVALID

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 2 minutes.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-66, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987758

1. PERFORM CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform DTC confirmation procedure. Refer to [VC-66, "DTC Logic"](#).
4. Check self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
NO >> INSPECTION END

B2880 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2880 F/S RELAY

DTC Logic

INFOID:000000006987759

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2880	F/S RELAY (Signal stuck low)	During quick charging, the voltage of a quick charge relay control circuit is less than 1 V for 3 seconds or more.	<ul style="list-style-type: none"> • Harness or connectors • Quick charge relay • On-board charger • F/S CHG relay • F/S relay
	F/S RELAY (Signal stuck high)	During quick charging, the voltage of a quick charge relay control circuit is 9 V or more for 3 seconds or more.	<ul style="list-style-type: none"> • Harness or connectors • F/S CHG relay • F/S relay • On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform Quick charging at least 15 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-67, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987760

SIGNAL STUCK LOW

1. CHECK F/S CHG RELAY ROUTING CIRCUIT

Check F/S CHG relay power supply circuit. Refer to [EVC-284, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Repair or replace error-detected parts.

2. CHECK QUICK CHARGE RELAY POWER SUPPLY CIRCUIT

1. Turn power switch OFF.
2. Remove F/S CHG relay.
3. Disconnect DC/DC junction box harness connector.
4. Check the continuity between F/S CHG relay harness connector and DC/DC junction box harness connector.

+		-		Continuity
F/S CHG relay	DC/DC J/B			
terminal	Connector	terminal		
5	F12	12	Existed	

5. Also check harness for short to ground.

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace error-detected parts.

3. CHECK QUICK CHARGE RELAY DRIVE CIRCUIT

1. Turn power switch OFF.

B2880 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

2. Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	terminal	Connector	terminal	
F11	2	B26	17	Existed
	9		16	

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK QUICK CHARGE RELAY

Check the resistance between DC/DC junction box connector terminals.

Item	DC/DC J/B			Resistance (Approx.)
	Connector	+	-	
		Terminals		
Quick charge relay +	F11	12	2	10 – 70 Ω
Quick charge relay –			9	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace DC/DC junction box. Refer to [EVC-307. "Exploded View"](#).

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98. "Exploded View"](#).

NO >> Repair or replace error-detected parts.

SIGNAL STUCK HIGH

1.CHECK QUICK CHARGE RELAY DRIVE VOLTAGE

1. Turn power switch ON.
2. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal		
B26	16	Ground	0 V
	17		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-51. "Intermittent Incident"](#).

NO >> GO TO 2.

2.CHECK QUICK CHARGE RELAY POWER SUPPLY

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

B2880 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

+		-	Voltage (Approx.)
DC/DC J/B			
Connector	terminal		
F11	12	Ground	0 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK QUICK CHARGE RELAY POWER SUPPLY CIRCUIT

1. Turn power switch OFF.
2. Disconnect F/S CHG relay.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage
DC/DC J/B			
Connector	terminal		
F11	12	Ground	0 V

5. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. CHECK DC/DC JUNCTION BOX TERMINAL VOLTAGE

Check the voltage between DC/DC junction box connector and ground.

+		-	Voltage
DC/DC J/B			
Connector	terminal		
F11	2	Ground	0 V
	9		

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace DC/DC junction box. Refer to [EVC-307, "Exploded View"](#).

5. CHECK QUICK CHARGE RELAY DRIVE CIRCUIT

1. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal		
B26	16	Ground	0 V
	17		

2. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

B2880 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).
- NO >> Repair or replace error-detected parts.

B28A0 NORMAL CHARGING CONNECTOR INTERLOCK

< DTC/CIRCUIT DIAGNOSIS >

B28A0 NORMAL CHARGING CONNECTOR INTERLOCK

Description

INFOID:000000006987761

The high voltage connector connection detecting circuit monitors the connection status of the high voltage connector.

The high voltage connector connection detecting circuit is composed of 2 circuits: the input side and output side. When the high voltage connector is connected, the input side and outputs side are connected via the contacts inside the high voltage connector, forming the circuit.

On-board charger outputs monitor voltage to the output of the high voltage connector connection detecting circuit, and monitors the high voltage connector connection status from the input voltage on the input side.

DTC Logic

INFOID:000000006987762

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B28A0	NORMAL CHARGE INTER-LOCK (AC) (Signal stuck high)	During normal charging, the input voltage of the interlock detecting circuit is 0.8 V or less for 3 seconds or more.	<ul style="list-style-type: none">On-board charger (Interlock detecting circuit)High voltage harnessNormal charge port

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-71, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987763

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).
Check voltage in high voltage circuit. (Check that condenser are discharged.)

B28A0 NORMAL CHARGING CONNECTOR INTERLOCK

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136. "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

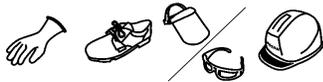


2. Measure voltage between high voltage harness terminals.

DANGER:

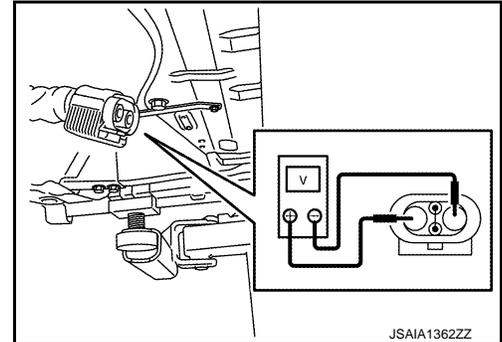


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2.CHECK INTERLOCK DETECTING CIRCUIT POWER SUPPLY

1. Turn power switch OFF.
2. Disconnect Normal charge port high voltage harness connector.
3. Turn power switch ON.
4. Check the voltage between normal charge port high voltage harness connector and ground.

+		-	Voltage (Approx.)
Normal charge port			
Connector	Terminal	Ground	5 V
H8	10		

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK INTERLOCK DETECTING CIRCUIT (OUTPUT SIDE)

1. Turn power switch OFF.
2. Disconnect on-board charger high voltage harness connector.
3. Check the continuity between on-board charger harness connector and normal charge port harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	Existed
H6	40	H8	10	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

B28A0 NORMAL CHARGING CONNECTOR INTERLOCK

< DTC/CIRCUIT DIAGNOSIS >

4.CHECK ON-BOARD CHARGER POWER SUPPLY AND GROUND CIRCUIT

Check on-board charger power supply and ground circuit. Refer to [VC-39, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).

NO >> Repair or replace error-detected parts.

5.CHECK NORMAL CHARGE PORT

1. Turn power switch OFF.
2. Check the continuity between normal charge port connector terminals.

Normal charge port		Continuity
Terminal		
+	-	Existed
10	11	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace normal charge port.

6.CHECK INTERLOCK DETECTING CIRCUIT (INPUT SIDE)

1. Disconnect on-board charger high voltage harness connector.
2. Check the continuity between on-board charger harness connector and normal charge port harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	Existed
H6	41	H8	11	

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).

NO >> Repair or replace the error-detected parts.

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B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

Description

INFOID:000000006987764

The high voltage connector interlock detecting circuit monitors the connection status of the high voltage connector.

The high voltage connector interlock detecting circuit is composed of 2 circuits: the input side and output side. When the high voltage connector is connected, the input side and outputs side are connected via the contacts inside the high voltage connector, forming the circuit.

The ECU outputs monitor voltage to the output of the high voltage connector interlock detecting circuit, and monitors the high voltage connector connection status from the input voltage on the input side.

DTC Logic

INFOID:000000006987765

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B28B0	NORMAL CHARGE INTER-LOCK (DC) (Signal stuck high)	During normal charging, the input voltage of the interlock detecting circuit is 0.8 V or less for 3 seconds or more.	<ul style="list-style-type: none">On-board charger (Interlock detecting circuit)High voltage harness

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-74, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987766

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).
Check voltage in high voltage circuit. (Check that condenser are discharged.)

B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136. "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:

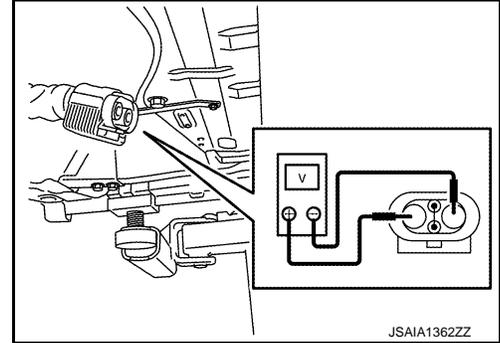


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2.CHECK HIGH VOLTAGE HARNESS CONNECTOR

1. Turn power switch OFF.
2. Disconnect on-board charge high voltage harness connector.
3. Check the continuity between high voltage harness connector terminals.

Normal charge port		Continuity
Terminal		
+	-	Existed
42	43	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace high voltage harness.

3.CHECK ON-BOARD CHARGER POWER SUPPLY AND GROUND CIRCUIT

Check on-board charger power supply and ground circuit. Refer to [VC-39. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51. "Intermittent Incident"](#).

Is inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98. "Exploded View"](#).

NO >> Repair or replace the error-detected parts.

B2900, B2902 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2900, B2902 ON-BOARD CHARGER

DTC Logic

INFOID:000000006987767

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2900	ON BOARD CHARGER (Program memory error)	On-board charger ROM is malfunctioning.	On-board charger
	ON BOARD CHARGER (Data memory error)	On-board charger RAM is malfunctioning.	
B2902	ON BOARD CHARGER (General memory error)	On-board charger EEPROM is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

1. Turn power switch ON and wait at least 5 seconds.
2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-76. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987768

1. PERFORM CONFIRMATION PROCEDURE AGAIN

1. Erase self-diagnostic result.
2. Perform DTC confirmation procedure. Refer to [VC-76. "DTC Logic"](#).
3. Check self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-98. "Exploded View"](#).
NO >> INSPECTION END

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

B2980 QUICK CHARGE PORT

Description

INFOID:000000006987769

The quick charge port contains a temperature sensor, and the quick charge port temperature signal is sent as a voltage signal to the on-board charger.

DTC Logic

INFOID:000000006987770

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2980	QUICK CHARGE PORT TEMP (Signal stuck high)	<ul style="list-style-type: none">During quick charging, the quick charge port temperature sensor signal voltage is 4.6V or more for 3 seconds or more.During quick charging, the quick charge port temperature sensor signal voltage is less than 0.15 V for 3 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Quick charge port is open or shorted)Quick charge portQuick charger
	QUICK CHARGE PORT TEMP (component or system over temperature)	During quick charging, the quick charge port temperature sensor signal voltage is 4.4V or more and less than 4.6V for 3 seconds or more.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform quick charging at least 10 seconds.
2. Turn power switch ON.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [VC-77, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987771

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136. "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:

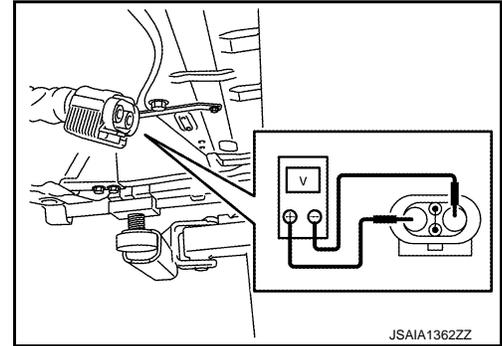


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform the confirmation procedure again using a quick charger other than the one that is used for the initial confirmation procedure. Refer to [VC-77. "DTC Logic"](#).

Is the DTC detected again?

YES >> GO TO 3.

NO >> INSPECTION END (quick charger malfunction)

3.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the quick charge port.

4.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
On-board charger		Quick charge port		
Connector	Terminal	Connector	Terminal	
E70	9	B27	25	Existed
	10		26	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

5.PERFORM COMPONENT INSPECTION

Perform component inspection. Refer to [VC-79, "Component Inspection \(Quick Charge Port\)".](#)

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace quick charge port. Refer to [VC-103, "Exploded View".](#)

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident".](#)

Is inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98, "Exploded View".](#)

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Port)

INFOID:0000000006987772

1.QUICK CHARGE PORT (TEMPERATURE SENSOR)

1. Turn power switch OFF.
2. Disconnect engine quick charge port harness connector.
3. Check the resistance between quick charge port terminals.

Terminals	Condition		Resistance (Ω)
9 and 10	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	5 – 50

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-103, "Exploded View".](#)

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B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

B29A0 NORMAL CHARGE PORT

DTC Logic

INFOID:000000006987773

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B29A0	N/CHG PORT ENGAGEMENT ERROR (Signal stuck high)	<ul style="list-style-type: none">When normal charging is started or during charging, the EVSE interlock detecting circuit signal voltage is approximately 4.3 V or more, or approximately 0.8 V or lower for 3 seconds or more.During normal charging, the EVSE interlock detecting circuit signal voltage is 3.3 V or more for 3 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Normal charge port is open or shorted)Normal charge portEVSEOn-board charger
	N/CHG PORT ENGAGEMENT ERROR (Signal invalid)	During normal charging, the EVSE interlock detecting circuit signal voltage is approximately 2 V or more and 3.3 V or less for 100 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Quick charge port is open or shorted)Quick charge port

DTC CONFIRMATION PROCEDURE

SIGNAL STUCK HIGH

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-80. "Diagnosis Procedure"](#).
NO >> INSPECTION END

SIGNAL INVALID

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform normal charging at least 2 minutes.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-80. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987774

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5. "High Voltage Precautions"](#).

CAUTION:

B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

SIGNAL STUCK HIGH

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

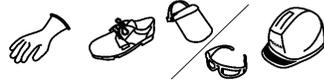


2. Measure voltage between high voltage harness terminals.

DANGER:

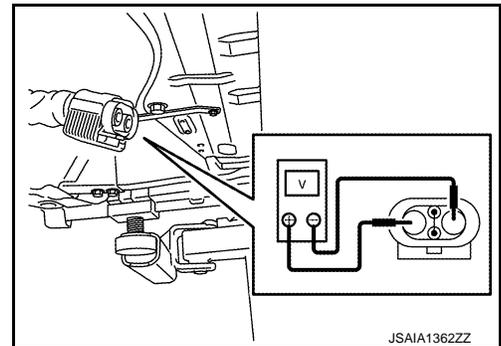


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform the confirmation procedure again using a EVSE other than the one that is used for the initial confirmation procedure. Refer to [VC-80, "DTC Logic"](#).

Is the DTC detected again?

YES >> GO TO 3.

NO >> Replace EVSE.

3. CHECK EVSE INTERLOCK DETECTING CIRCUIT POWER SUPPLY

1. Turn power switch OFF.
2. Disconnect normal charge port harness connector.
3. Turn power switch ON.
4. Check the voltage between normal charge port harness connector and ground.

+		-	Voltage (Approx.)
Connector	Terminal		
E71	2	Ground	5 V

Is the inspection result normal?

B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK EVSE INTERLOCK DETECTING CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between normal charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E71	2	B25	10	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace error-detected parts.

5.CHECK EVSE INTERLOCK DETECTING CIRCUIT GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
H8	5	H6	35	Existed

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK NORMAL CHARGE PORT

Perform component inspection. Refer to [VC-83. "Component Inspection \(Normal Charge Port\)".](#)

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Replace normal charge port. Refer to [VC-108. "Removal and Installation".](#)

7.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51. "Intermittent Incident".](#)

Is inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-98. "Removal and Installation".](#)
NO >> Repair or replace error-detected parts.

SIGNAL INVALID

1.PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31. "How to Cut Off High Voltage".](#)

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136. "Removal and Installation".](#)

DANGER:

B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



- Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

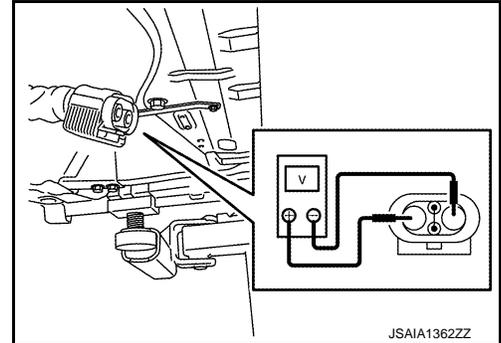


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



>> GO TO 2.

2.CHECK EVSE RELEASE SWITCH STATUS

Check that there are no operation malfunctions caused by dust or a foreign substance on the EVSE release switch.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or clean.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

- Turn power switch ON.
- Erase self-diagnostic result.
- Use an EVSE which is different from the EVSE used for the first DTC confirmation procedure, and perform the DTC confirmation procedure again.

Is the DTC detected again?

YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

NO >> Replace EVSE.

Component Inspection (Normal Charge Port)

INFOID:000000006987775

1.NORMAL CHARGE PORT

- Turn power switch OFF.
- Disconnect EVSE.
- Disconnect normal charge port harness connector.
- Check the resistance between normal charge port terminals.

Terminals	Resistance (kΩ)
2 and 5	2.43 – 2.97

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace normal charge port. Refer to [VC-108, "Removal and Installation"](#).

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

B29C1 EVSE

DTC Logic

INFOID:000000006987776

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B29C1	EVSE (No signal)	During normal charging, although the AC power is being input, the PWM communication signal from EVSE is interrupted.	<ul style="list-style-type: none">• Harness or connectors (Normal charge port is open or shorted)
	EVSE (Signal stuck low)	When normal charging, AC power is not input even though the on-board charger permits charging start.	<ul style="list-style-type: none">• Normal charge port• EVSE• On-board charger
	EVSE (Unexpected operation)	When normal charging is started, AC power is input even though the EVSE communication does not start.	<ul style="list-style-type: none">• EVSE• On-board charger
	EVSE (Signal stuck high)	After charging is complete, AC power continues to input even though the on-board charger stops charging.	<ul style="list-style-type: none">• Harness or connectors (Normal charge port is shorted)

DTC CONFIRMATION PROCEDURE

EXCEPT "SIGNAL STUCK HIGH"

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform normal charging for the time listed below.

Malfunction type	Time
No signal	1 minute or more.
Signal stuck low	10 seconds or more.
Unexpected operation	10 seconds or more.

2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-84. "Diagnosis Procedure"](#).
NO >> INSPECTION END

SIGNAL STUCK HIGH

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Perform normal charging until charging is completed.
2. Turn power switch ON.
3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to [VC-84. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006987777

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

"SIGNAL INVALID", "NO SIGNAL" and "SIGNAL STUCK LOW"

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution. Voltage might remain/is present on terminals.

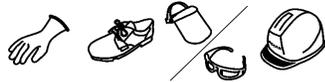


2. Measure voltage between high voltage harness terminals.

DANGER:

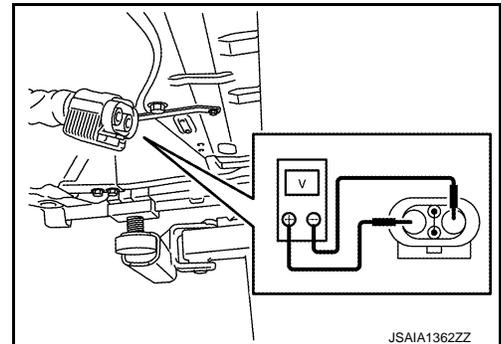


Touching high voltage components without using the appropriate protective equipment will cause electrocution. Voltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2. CHECK SELF-DIAGNOSTIC RESULT IN VCM

1. Turn power switch ON.
2. Check self-diagnostic result in VCM.

Is any DTC is detected?

- YES >> Check the DTC. Refer to [EVC-78, "DTC Index"](#).
- NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE AGAIN-I

1. Erase self-diagnostic result.
2. Perform the confirmation procedure again using a EVSE other than the one that is used for the initial confirmation procedure. Refer to [VC-84, "DTC Logic"](#).

Is the DTC detected again?

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 4.
NO >> Replace EVSE.

4.CHECK HIGH VOLTAGE HARNESS

1. Turn power switch OFF.
2. Disconnect normal charge port harness connector and on-board charger harness connector.
3. Turn power switch ON.
4. Check the voltage between normal charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	Existed
H8	4	H6	34	
	5		35	
	6		36	
E71	1	B25	9	
	2		10	

5. Also check harness for short to ground and check for short circuits between wires.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.PERFORM DTC CONFIRMATION PROCEDURE AGAIN-II

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Perform DTC confirmation procedure. Refer to [VC-84, "DTC Logic"](#).

Is DTC "B29C1-signal stuck low" detected?

- YES >> Replace on-board charger (fuse is fusing). Refer to [VC-98, "Exploded View"](#).
NO >> INSPECTION END

"UNEXPECTED OPERATION" and "SIGNAL STUCK HIGH"

1.PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

2. Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.

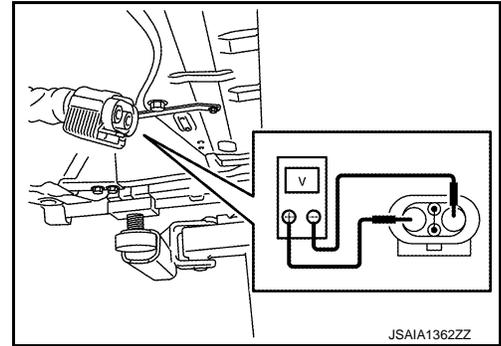


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



>> GO TO 2.

2.CHECK EVSE SPECIFICATIONS

Check whether or not the EVSE conforms to the SAE-J1772 standard.

Is the correct EVSE being used?

YES >> GO TO 3.

NO >> Explain to the customer that the correct EVSE must be used.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Use an EVSE which is different from the EVSE used for the first DTC confirmation procedure, and perform the DTC confirmation procedure again.

Is the DTC detected again?

YES >> GO TO 4.

NO >> Replace EVSE.

4.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-98, "Exploded View"](#).

NO >> Repair or replace error-detected parts.

ON BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

ON BOARD CHARGER

Component Insulation Check

INFOID:000000006987778

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Disconnect high voltage connector from front side of Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



2. Measure voltage between high voltage harness terminals.

DANGER:

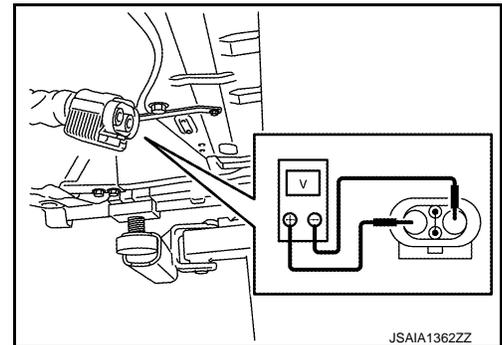


Touching high voltage components without using the appropriate protective equipment will cause electrocution.oltage might remain/is present on terminals.



Standard

: 5 V or less



CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

>> GO TO 2.

2. CHECK INSULATION RESISTANCE OF ON-BOARD CHARGER

1. Disconnect high voltage harness connector H5.
2. Check the resistance between on-board charger connector terminal and ground.

CAUTION:

ON BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

- A tester has a polarity. Be sure to check polarity and connect the tester in the forward direction to the circuit.
- If the inspection result shows that there is no continuity, check that the parts are mounted correctly.

+	-	Resistance
On-board charger		
Terminal		
31	Ground	20 MΩ or more
32		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace on-board charger. Refer to [VC-98, "Removal and Installation"](#).

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CHARGING STATUS INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

CHARGING STATUS INDICATOR

Diagnosis Procedure

INFOID:000000006987779

Refer to [EVC-297, "Component Function Check"](#).

IMMEDIATE CHARGING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

IMMEDIATE CHARGING SWITCH

Diagnosis Procedure

INFOID:000000006987780

Refer to [EVC-300. "Diagnosis Procedure"](#).

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ON BOARD CHARGER

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

ON BOARD CHARGER

Symptom Table

INFOID:000000006987781

Refer to [EVC-303, "Symptom Table"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Symptom Table

INFOID:000000006987782

Symptoms	Check items	Solution
Immediate charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	Timer charge has been set.	Push immediate charging switch.
	The Li-ion battery is already fully charged.	No action. NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.	

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Timer charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	The Li-ion battery is already fully charged.	No action NOTE: Charging cannot be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.
	The EVSE is not connected.	Connect the EVSE.
	Charging does not start because the timer charge start time and end time are set and the current time is before the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because only the timer charge start time is set and the current time is after the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because only the timer charge end time is set and the current time is after the set end time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because the charge amount has been set to 80% and the Li-ion battery is already charged to more than 80%.	Confirm the charge percentage set in the timer charge. Change the charging percentage the desired charge setting.
	The time on the clock is wrong.	Confirm that the date and time shown on the timer charge screen are the same as the clock on the navigation display. NOTE: If the 12V battery terminal is disconnected, the time setting must be updated. There must be a GPS signal to adjust the timer setting clock.
The immediate charging switch has been pressed.	Check immediate charging switch.	
Timer charge has not been set.	Set the timer charge schedule.	

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution	
Remote charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.	A
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.	B
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.	VC
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.	D
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.	E
	The Li-ion battery is already fully charged.	No action NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.	F
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.	G
	The 12V battery is discharged.	Charge the 12V battery.	H
	The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.	I
	The EVSE is not connected.	Connect the EVSE.	J
	Communication with the vehicle cannot be established.	Confirm that there is a cellular signal in your location. Remote charge can not be started unless the web enabled smart phone can connect to the internet. Confirm that there is a cellular signal at the vehicle location.	K
	The vehicle is left standing for long time.	NOTE: If the power switch is in the OFF position for more than 2 weeks, the remote charge is not performed.	L
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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Normal charge stops in the middle of charging.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The EVSE has been disconnected.	Check that the EVSE has not been disconnected.
	The release switch has been pressed.	Release the release switch. NOTE: If the charge connector button is pressed for a long period of time, charging will be stopped.
	Timer charge end time has been reached.	perform normal charge (immediate charge). NOTE: When timer charge is set and the charge end time is reached, charging will be stopped, even if the Li-ion battery is not fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.
Quick charge cannot be performed.	The charge connector is not connected correctly.	Check that the charge connector is connected correctly and that it is locked.
	The self-diagnostic function of the quick charger detects a isolation error.	VC-50
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	The Li-ion battery is already fully charged.	No action NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.
	The power switch of the quick charger is off.	Check the power switch of the quick charger.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution	
Quick charge stops in the middle of charging	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.	A B
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.	VC D
	The vehicle has a malfunction.	Check self-diagnostic result in on-board charger.	E
	Charging is stopped by the quick charge timer.	Perform quick charge again (as needed). NOTE: Charging will stop depending on the timer function setting of the quick charger.	F
		Perform quick charge again (as needed). NOTE: Charging will stop depending on the timer of the vehicle.	G
	Charging stops at 90% capacity.	Perform quick charge again (as needed). NOTE: When charging has been started when the Li-ion battery remaining energy is less than half, charging will stop when the energy reaches 90%.	H
The power supply for the quick charger is off.	Check whether the power supply for the quick charger is off.	I	

ON BOARD CHARGER

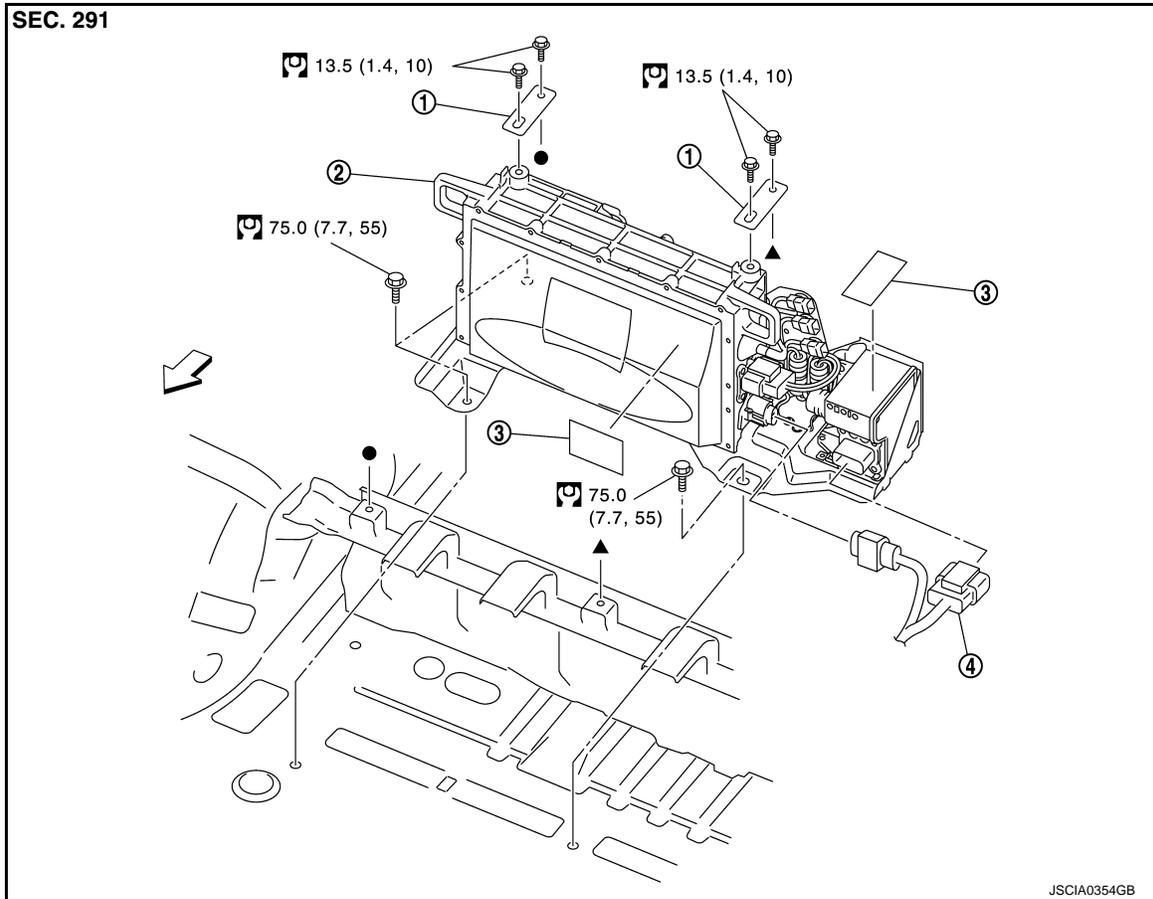
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

ON BOARD CHARGER

Exploded View

INFOID:000000006987783



1. Grounding plate

2. On board charger

3. High voltage warning label

4. High voltage harness

↔ : Vehicle front

 : N·m (kg·m, ft·lb)

Removal and Installation

INFOID:000000006987784

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

REMOVAL

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Remove Li-ion battery under cover.

WARNING:



To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



- b. Disconnect high voltage connector from front side of Li-ion battery.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.



- c. Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.

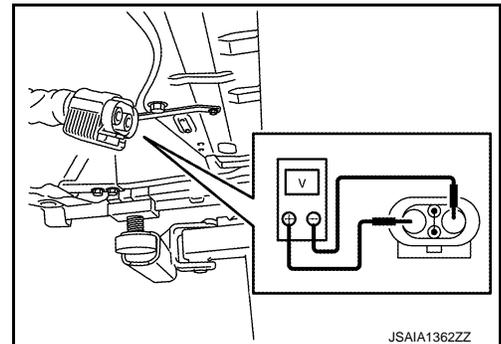


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.

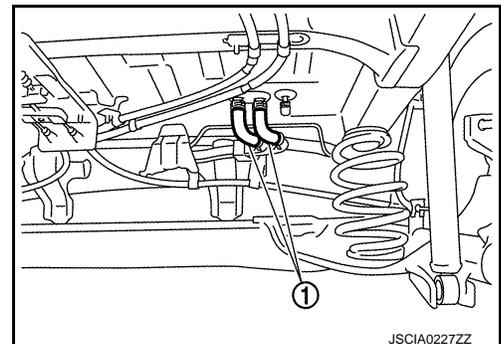


2. Remove rear under cover. Refer to [EXT-21, "REAR DIFFUSER : Exploded View"](#).
3. Drain coolant from radiator. Refer to [HCO-9, "Draining and Refilling"](#).
4. Disconnect water hoses (1) from on board charger.

WARNING:



To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



5. Remove rear seatback. Refer to [SE-24, "SEATBACK : Removal and Installation"](#).
6. Remove seat cushion. Refer to [SE-23, "SEAT CUSHION : Removal and Installation"](#).
7. Remove luggage floor upper finisher. Refer to [INT-34, "LUGGAGE FLOOR UPPER FINISHER : Removal and Installation"](#).

ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

- Remove luggage floor front finisher. Refer to [INT-34, "LUGGAGE FLOOR FRONT FINISHER : Removal and Installation"](#).
- Disconnect high voltage harness connector (A) of on board charger, and high voltage harness connector (B) of noise filter.

WARNING:

-  To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.

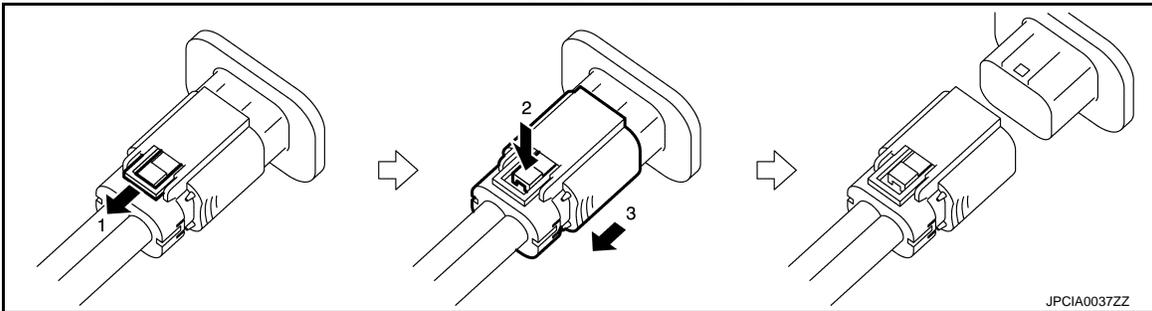


- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

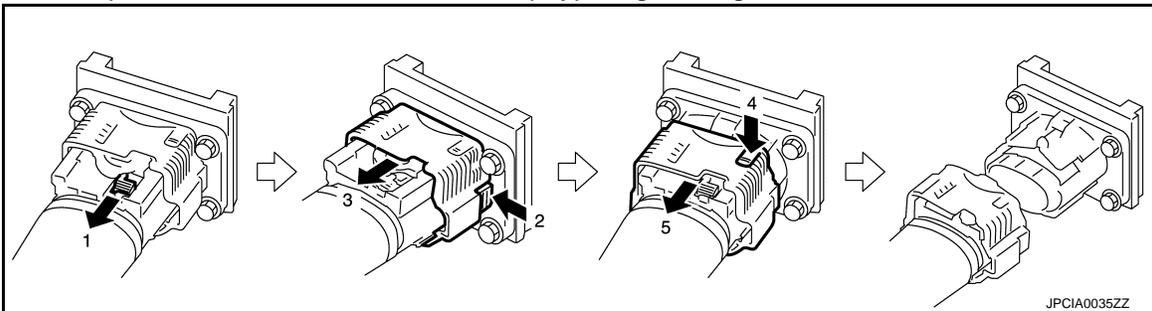
On board charger high voltage connector : 3 step type

Noise filter high voltage connector : 2 step type

- Follow steps shown below to remove a 2-step type high voltage connector.



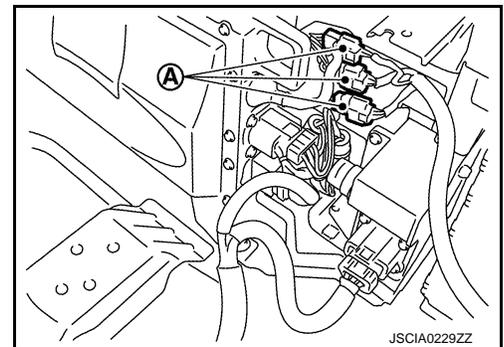
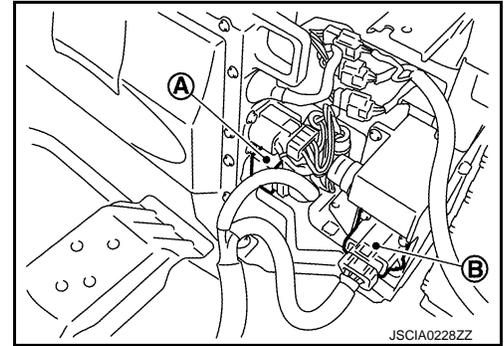
- Follow steps shown below to remove a 3-step type high voltage connector.



- Disconnect 12V system connector (A) of on board charger.

WARNING:

-  To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



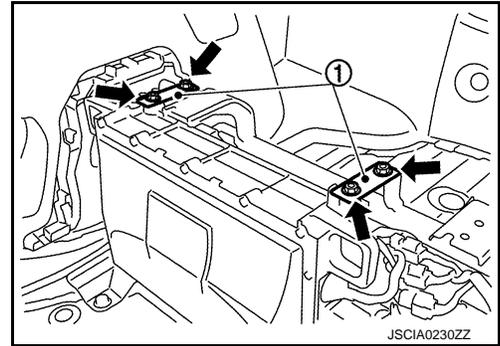
ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

11. Remove grounding plate (1) of on board charger.

WARNING:

 To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.

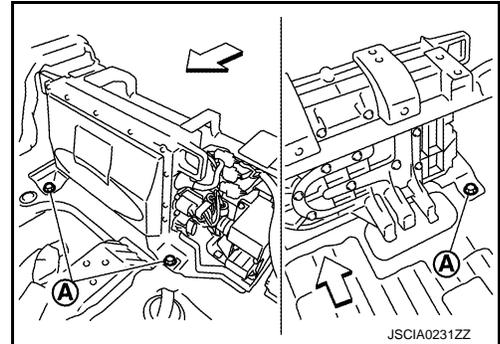


12. Remove on board charger mounting bolt (A).

 : Vehicle front

WARNING:

 To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.

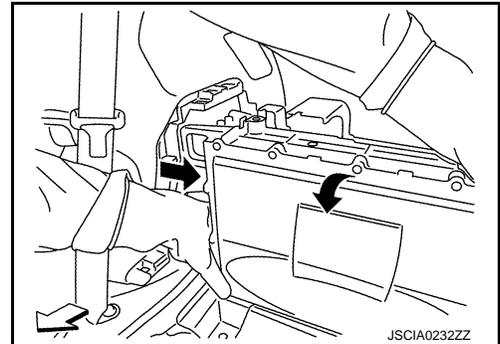


13. Move on board charger toward vehicle left side while avoiding right side trim, then remove on board charger by tilting it toward the front while avoiding tower bar.

 : Vehicle front

WARNING:

 Be sure to put on insulating protective gear before beginning work on the high voltage system.



CAUTION:

- Take care that coolant does not contact the high voltage harness connectors.
- To prevent performance degradation, if coolant contacts a high voltage harness connector, immediately dry the high voltage connector completely with an air blow gun.

INSTALLATION

Pay attention to the following and install by following the procedure for removal in the reverse order.

WARNING:

Be sure to put on insulating protective gear before beginning work on the high voltage system.



CAUTION:

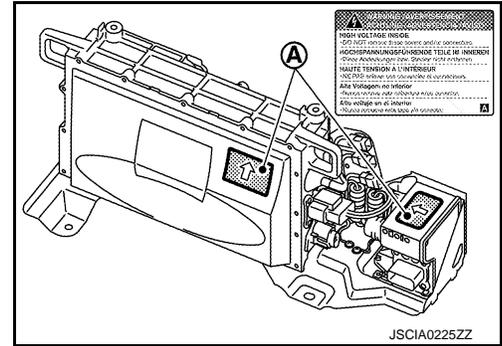
-  To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.
- Be sure to perform correct air bleeding after adding coolant. Refer to [HCO-9. "Draining and Refilling"](#).

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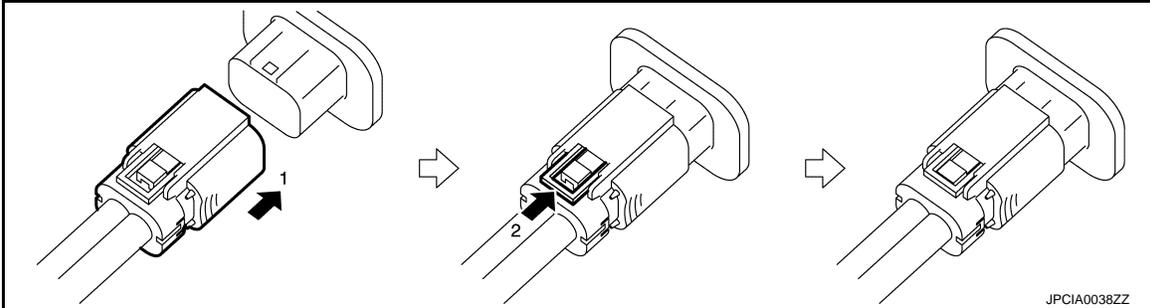
ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

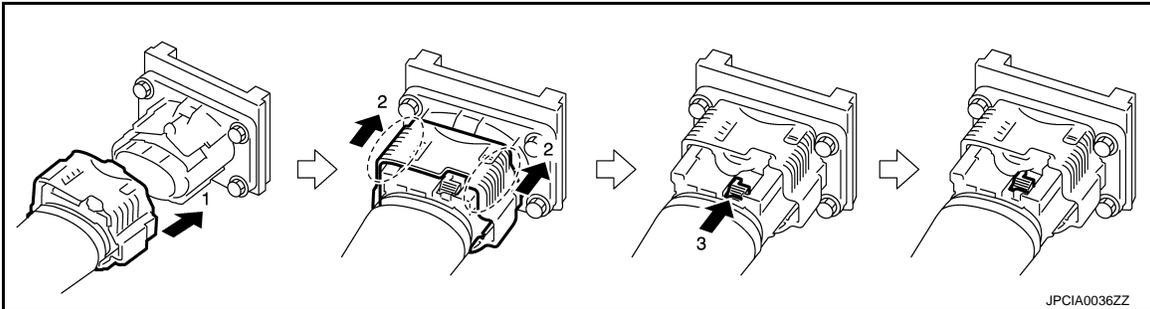
- If on board charger was replaced, apply high voltage warning label at position (A), with top facing in the direction of arrow.



- Follow the procedure below and connect the 2-step type high voltage harness connector.



- Follow the procedure below and connect the 3-step type high voltage harness connector.



- After all parts are installed, be sure to check equipotential. Refer to [VC-102, "Inspection"](#).

Inspection

INFOID:000000006987785

INSPECTION AFTER INSTALLATION

After installing on board charger, measure resistance between on board charger (aluminum part) and body (ground bolt) and check equipotential.

WARNING:

 To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



Between On board charger – Body ground : 0.1 Ω

If result deviates from standard values, check that no paint, oil, dirt, or other substance is adhering to bolts or conductive mounting parts. If any such substance is adhering, clean the surrounding area and remove the substance.

QUICK CHARGE PORT

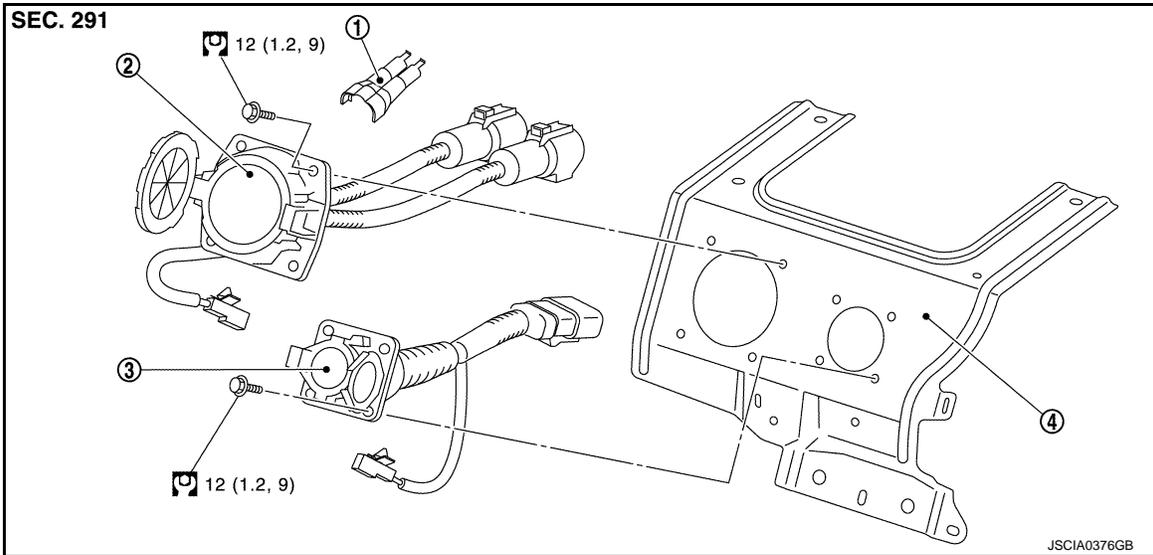
< REMOVAL AND INSTALLATION >

QUICK CHARGE PORT

Exploded View

INFOID:000000006987786

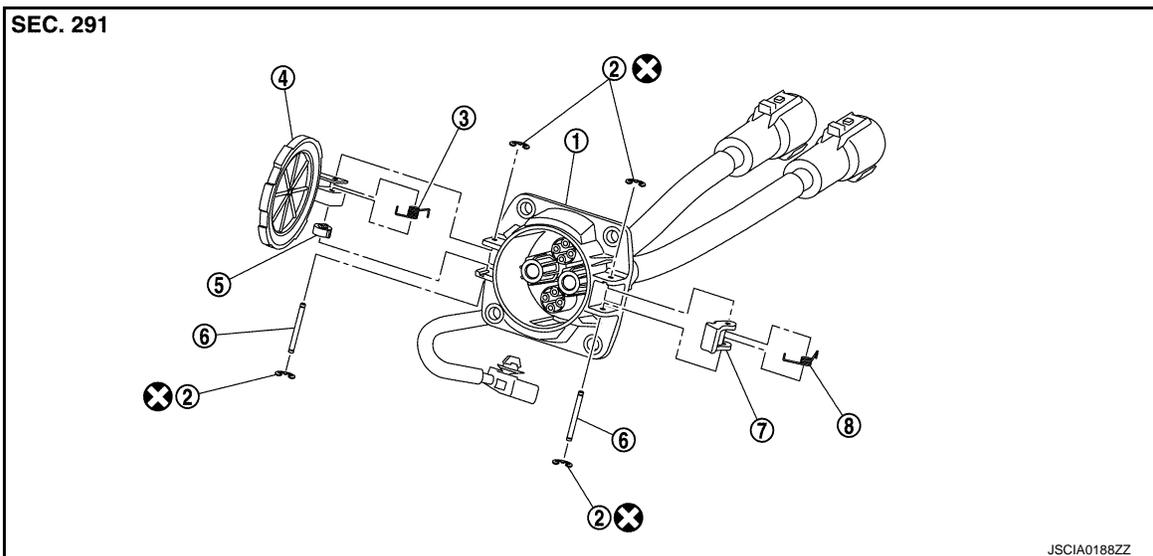
REMOVAL



- 1. Harness protector
- 2. Quick charge port
- 3. Normal charge port
- 4. Charge port bracket

 : N·m (kg·m, ft·lb)

DISASSEMBLY



- 1. Quick charge port
- 2. Clip
- 3. Spring
- 4. Port cap
- 5. Damper
- 6. Pin
- 7. Lever
- 8. Spring

Removal and Installation

INFOID:000000006987787

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are han-

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QUICK CHARGE PORT

< REMOVAL AND INSTALLATION >

dled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.

- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

REMOVAL

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Remove Li-ion battery under cover.

WARNING:



To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



- b. Disconnect high voltage connector from front side of Li-ion battery.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.



- c. Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.

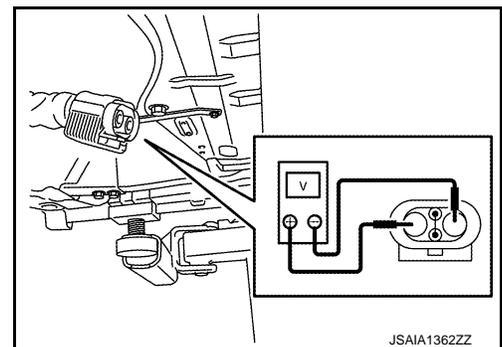


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



2. Remove radiator upper grille. Refer to [DLK-144, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).

QUICK CHARGE PORT

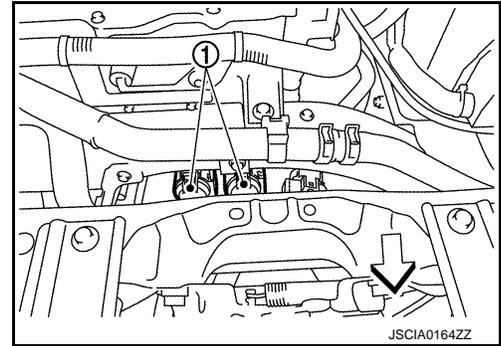
< REMOVAL AND INSTALLATION >

3. Remove quick charge port connector (1) inside motor room.

← : Vehicle front

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



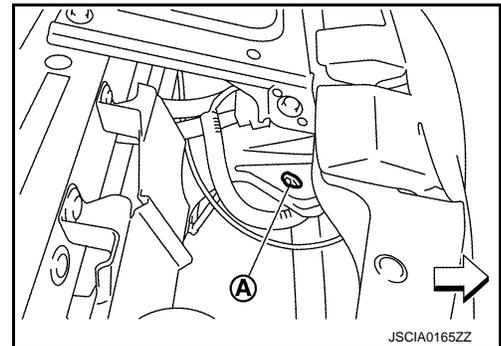
- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

4. Remove connector clip (A), and then remove interlock detecting circuit connector.

← : Vehicle front

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



5. Remove quick charge port mounting bolts, and pull quick charge port out from front of vehicle to remove it.

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



INSTALLATION

To install, pay attention to the following and follow procedure for removal in reverse order.

CAUTION:

Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

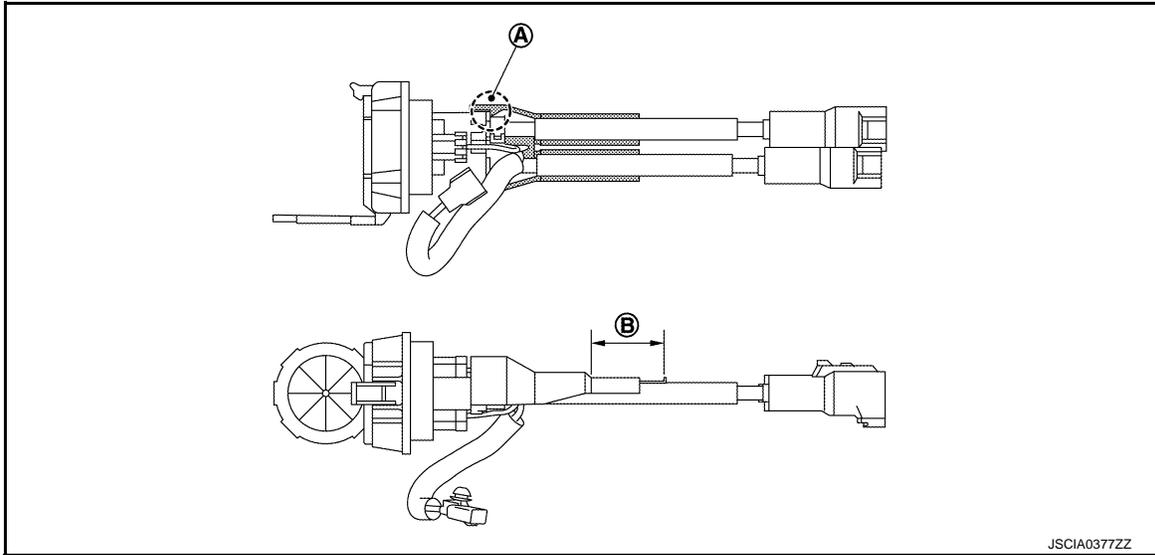
Harness Protector Installation Procedure

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QUICK CHARGE PORT

< REMOVAL AND INSTALLATION >

Set the protector at the position (A), wind vinyl tape for wire harness around (B) in the manner of half-lap to fix the harness protector.



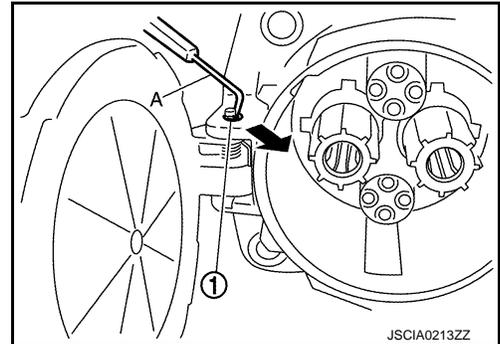
Disassembly and Assembly

INFOID:000000006987788

DISASSEMBLY

Cover Side

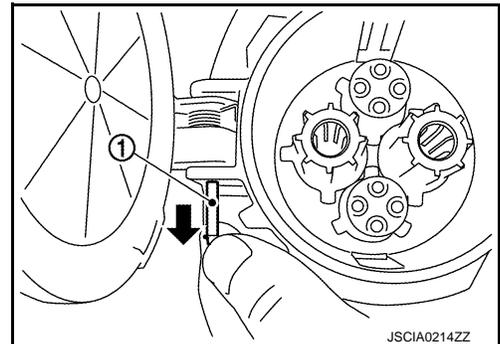
1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Pull out pin (1) of charge port cover.

CAUTION:

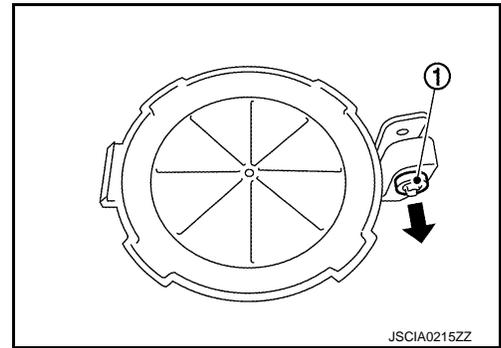
When pin is pulled out, the spring will also jump out. Take care not to lose it.



QUICK CHARGE PORT

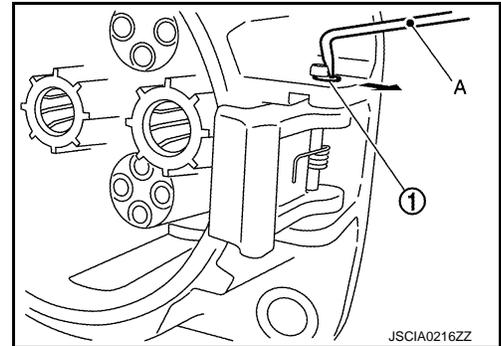
< REMOVAL AND INSTALLATION >

3. Remove damper (1) from charge port cover.

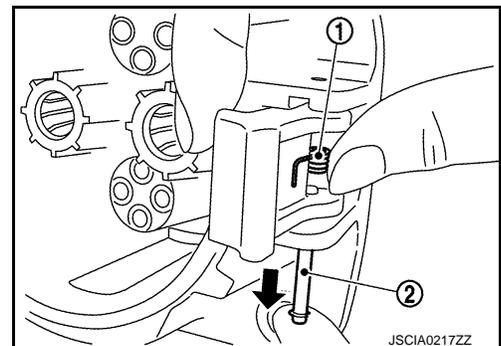


Lever Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Press while removing pin (2) to ensure that spring (1) does not jump out, then remove lever.

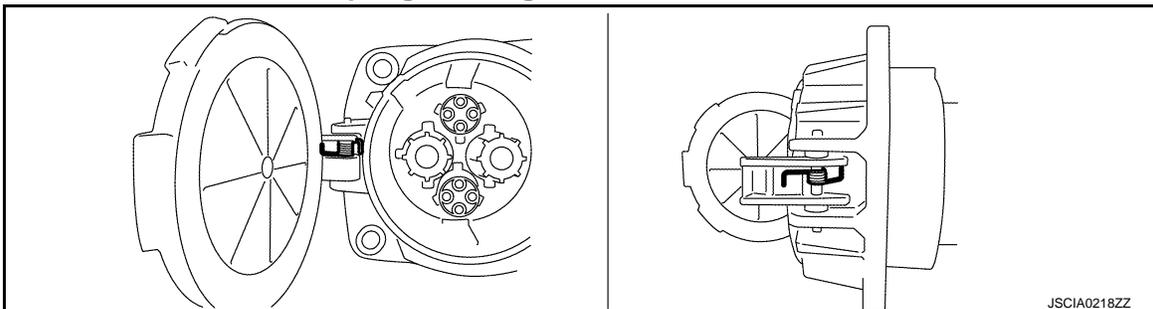


ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

CAUTION:

- Never reuse the clips.
- Pay attention to direction that cover side damper is facing.
- Pay attention to direction that spring is facing.



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NORMAL CHARGE PORT

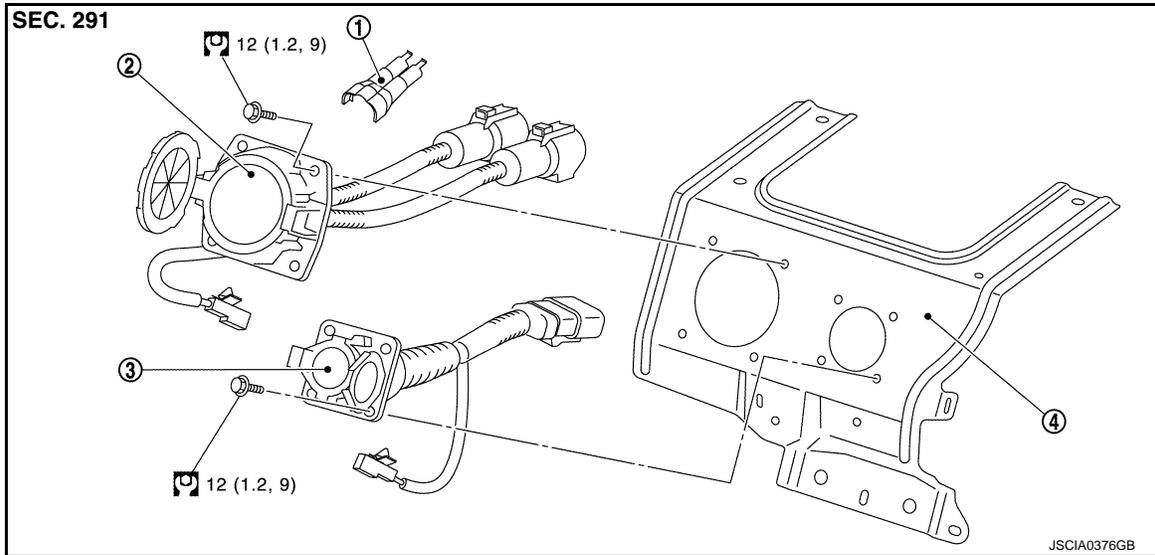
< REMOVAL AND INSTALLATION >

NORMAL CHARGE PORT

Exploded View

INFOID:000000007070943

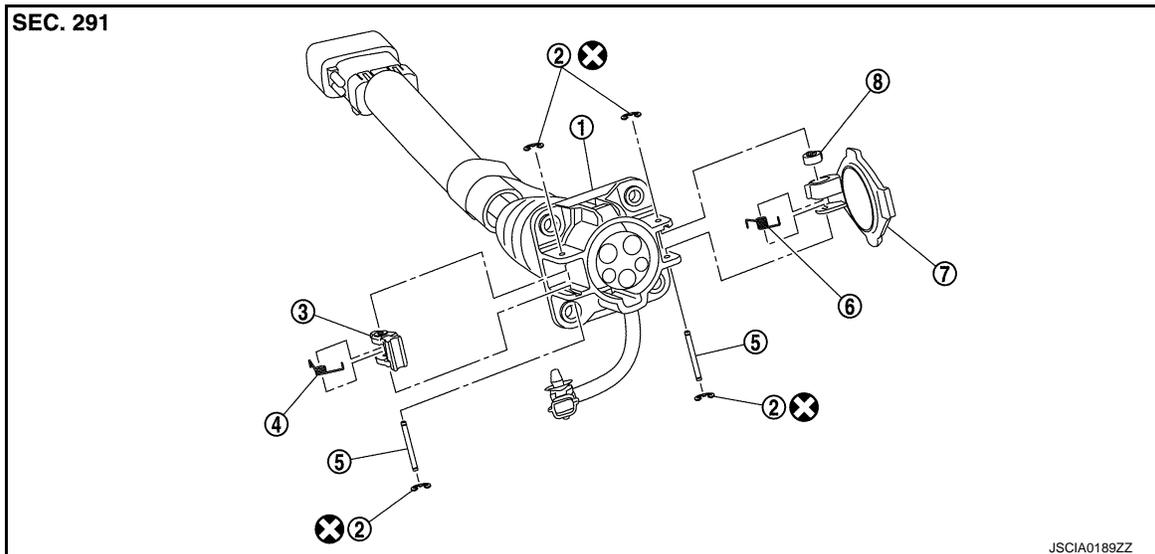
REMOVAL



- 1. Harness protector
- 2. Quick charge port
- 3. Normal charge port
- 4. Charge port bracket

 : N·m (kg-m, ft-lb)

DISASSEMBLY



- 1. Normal charge port
- 2. Clip
- 3. Lever
- 4. Spring
- 5. Pin
- 6. Spring
- 7. Port cap
- 8. Damper

 : Always replace every disassembly

Removal and Installation

INFOID:000000006987790

WARNING:

NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [VC-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

REMOVAL

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Remove Li-ion battery under cover.

WARNING:



To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



- b. Disconnect high voltage connector from front side of Li-ion battery.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.



- c. Measure voltage between high voltage harness terminals.

DANGER:



Touching high voltage components without using the appropriate protective equipment will cause electrocution.

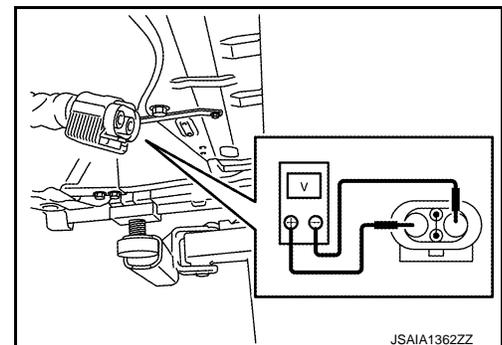


Standard

: 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500V or higher.



JSAIA1362ZZ

2. Remove radiator upper grille. Refer to [DLK-144, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).

NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

3. Remove normal charge port connector (1) inside motor room.

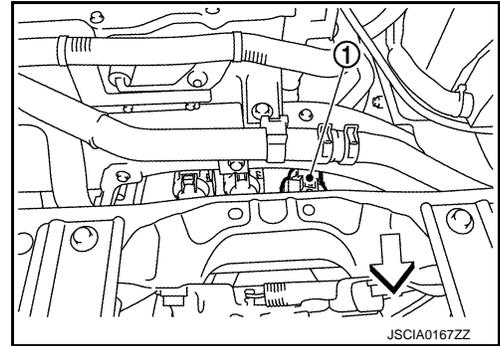
← : Vehicle front

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

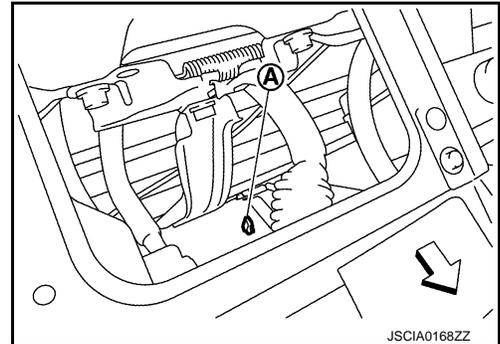


4. Remove connector clip (A), and then remove interlock detecting circuit connector.

← : Vehicle front

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



5. Remove normal charge port mounting bolts, and pull normal charge port out from front of vehicle to remove it.

WARNING:

- ⚡ To prevent shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.



INSTALLATION

To install, pay attention to the following and follow procedure for removal in reverse order.

CAUTION:

Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

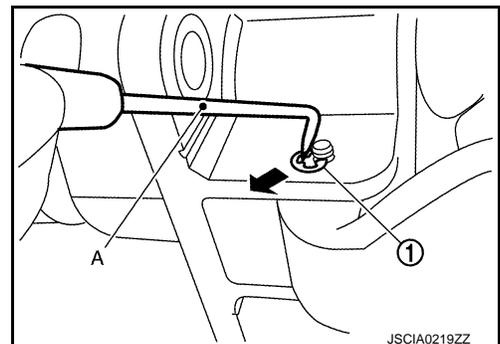
Disassembly and Assembly

INFOID:000000006987791

DISASSEMBLY

Cover Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



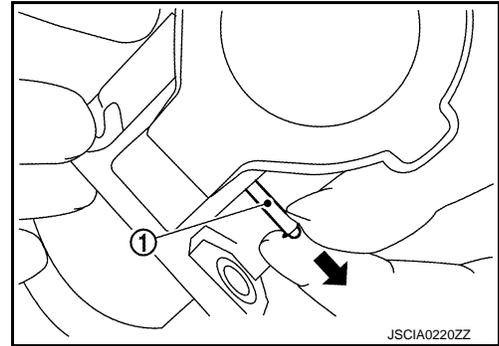
NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

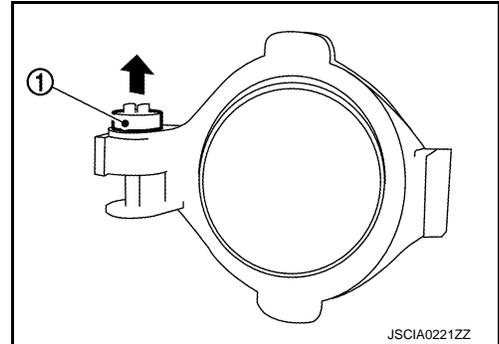
2. Pull out pin (1) of charge port cover.

CAUTION:

When pin is pulled out, the spring will also jump out. Take care not to lose it.

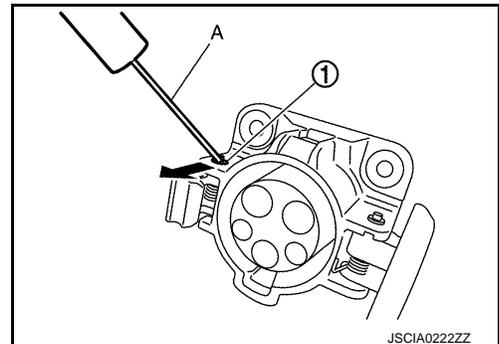


3. Remove damper (1) from charge port cover.

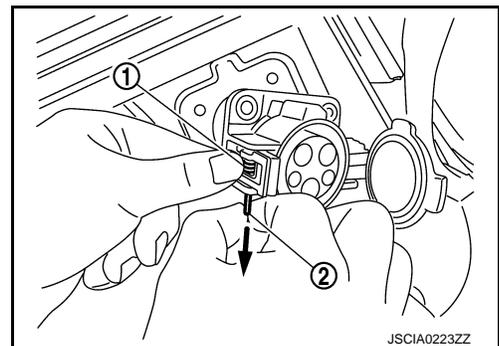


Lever Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Press while removing pin (2) to ensure that spring (1) does not jump out, then remove lever.



ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

CAUTION:

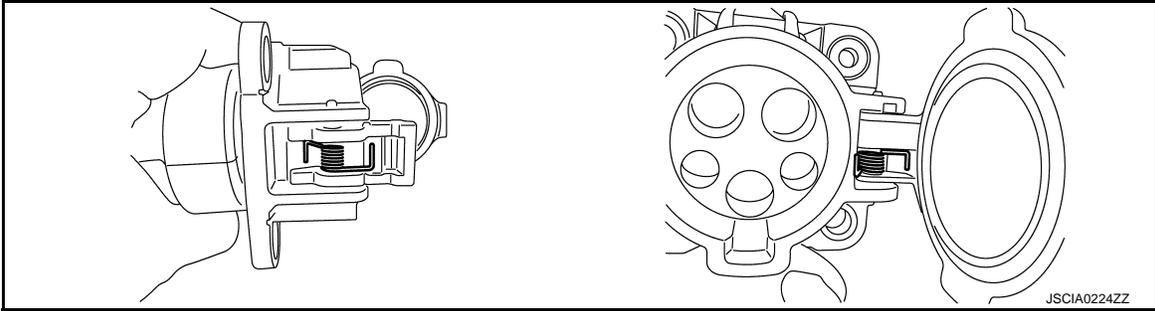
- Never reuse the clips.
- Pay attention to direction that cover side damper is facing.

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NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

- Pay attention to direction that spring is facing.



IMMEDIATE CHARGING SWITCH

< REMOVAL AND INSTALLATION >

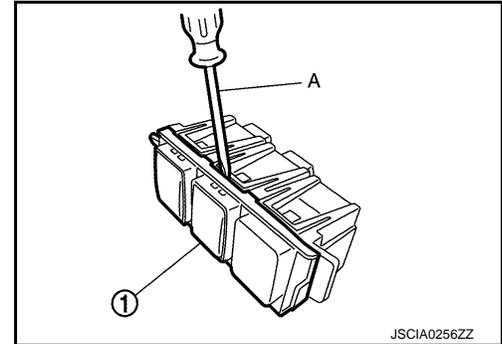
IMMEDIATE CHARGING SWITCH

Removal and Installation

INFOID:000000006987792

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-13, "Removal and Installation"](#).
2. Remove switch panel assembly from instrument lower panel LH.
3. Remove immediate charging switch from switch panel using a suitable tool.



INSTALLATION

Install in the reverse order of removal.

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CHARGING STATUS INDICATOR

< REMOVAL AND INSTALLATION >

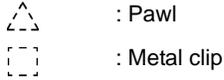
CHARGING STATUS INDICATOR

Removal and Installation

INFOID:000000006987793

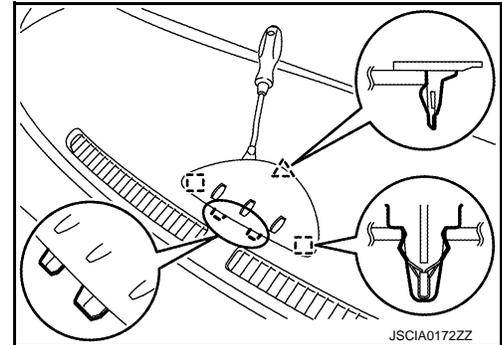
REMOVAL

1. Insert a removal tool between instrument panel and charge status indicator, and lift up tool to remove charge status indicator.



CAUTION:

- Wrap tool with protective tape so that it does not scratch instrument panel or charge status indicator.
- Apply shop cloth or take similar steps at location of tool fulcrum, and take care that no scratches or dents are made.



INSTALLATION

Position clips, and then press each into the instrument panel to fasten clips in place.